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THE

AMERICAN EPHEMERIS

AND

NAUTICAL ALMANAC

FOR THE YEAR

1916

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1914

U. S. NAVAL OBSERVATORY.

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* **Note.—Those whose names are printed in italics devote only a small portion of their time to work of the Nautical Almanac Office.**

January, 1914.

PREFACE.

This volume of the *American Ephemeris and Nautical Almanac* was prepared under the immediate supervision of Professor W. S. Eichelberger, U. S. N., the Director. The character of the matter herein contained is the same as in the immediately preceding volumes, but the arrangement has been changed in a number of instances. The changes in the Ephemeris have been made with the approval of the Astronomical Council of the Observatory upon the recommendation of the Director, after consultation with the Assistants of the Nautical Almanac Office.

This is the first volume to be issued under the international agreement resulting from the *Congrès International des Éphémérides Astronomiques* held at Paris in October, 1911.

The naval appropriation bill approved August 22, 1912, contained the following:

> The Secretary of the Navy is hereby authorized to arrange for the exchange of data with such foreign almanac offices as he may from time to time deem desirable, with a view to reducing the amount of duplication of work in preparing the different national nautical and astronomical almanacs and increasing the total data which may be of use to navigators and astronomers available for publication in the American Ephemeris and Nautical Almanac: *Provided,* That any such arrangement shall be terminable on one year's notice: *Provided further,* That the work of the Nautical Almanac Office during the continuance of any such arrangement shall be conducted so that in case of emergency the entire portion of the work intended for the use of navigators may be computed by the force employed by that office, and without any foreign cooperation whatsoever: *Provided further,* That any employee of the Nautical Almanac Office who may be authorized in any annual appropriation bill and whose services in whole or in part can be spared from the duty of preparing for publication the annual volumes of the American Ephemeris and Nautical Almanac may be employed by said office in the duty of improving the tables of the planets, moon, and stars, to be used in preparing for publication the annual volumes of the office: *Provided further,* That section four hundred and thirty-five, Revised Statutes, is hereby repealed.

In accordance with the authority granted by Congress, the Navy Department has expressed its willingness to adopt the program of exchanges of data recommended by the International Congress at

267158

Paris, October, 1911, with the understanding that the proposed agreement shall be terminable on one year's notice, and with the following conditions:

(*a*) That in adopting the resolution, "the ordinary ephemerides of the stars will hereafter be calculated to $0^s.001$ nearly in R. A. to 60° of declination, and $0''.01$ nearly in declination, not for every tenth day, but for every tenth culmination for the meridian of Greenwich * * *," the department is not committed to the printing of the extra decimals in right ascension and declination, nor to the exclusive use of the Greenwich meridian in the *American Ephemeris and Nautical Almanac.*

(*b*) With reference to the resolution, "the predictions of the eclipses and occultations will be made with every possible precision," it is understood that the data with regard to eclipses and occultations will be furnished with the same degree of precision as now published in the *American Ephemeris and Nautical Almanac.*

(*c*) With regard to the meridian of Greenwich and the resolution, "The conference expresses the wish that the adoption of the meridian of Greenwich for all the ephemerides be realized as soon as possible," the department accepts this resolution in spirit but with certain reservations. The *American Ephemeris and Nautical Almanac* has from the beginning used that meridian for nautical purposes, but on account of the remoteness of the American Continent from it, and the fact that the Naval Observatory and other observatories near its meridian are extensive users of the star places published by the *American Ephemeris and Nautical Almanac,* the department deems it expedient to reserve the right to publish certain ephemerides for the meridian of Washington.

The volume, as in previous years, is divided into three parts, as follows:

Part I, *Ephemeris for the Meridian of Greenwich,* which gives the ephemerides of the Sun and Moon, the geocentric and heliocentric positions of the major planets, and other fundamental astronomical data for equidistant intervals of Greenwich mean time.

The material of this part has been rearranged. All information needed in connection with observations of the positions of the Sun has been brought together, and the resulting solar ephemeris is given first in order and for the entire year. Then follows the lunar ephemeris for the entire year, embodying all the information for use in connection with observations of the position of the Moon. Finally, there appear the planetary ephemerides arranged in accordance with the planet's distance from the Sun, beginning with Mercury.

Part II, *Ephemeris for the Meridian of Washington*, which gives ephemerides of 825 stars, Sun, Moon, and major planets, for transit over the meridian of the Naval Observatory, Washington, which passes midway between the West and East Transit Circles of the Observatory. The mean places of the fixed stars and the data for their reduction are also included in Part II.

In this part the principal changes are that the number of circumpolar stars for which daily ephemerides are given has been increased to 35, and these ephemerides are given together; that the apparent right ascensions of stars whose declination is less than 60° are given to $0^s.001$; and that the apparent declinations of all stars are given to $0''.01$.

Part III, *Phenomena*, which contains predictions of phenomena to be observed, with data for their computation. Greenwich mean time is used throughout this part except with the occultations visible at Washington where Washington time is used. Tables for the determination of latitude and azimuth from Polaris, tables for the conversion of time, and an alphabetical list of observatories, with their latitudes, longitudes, and other data, are contained in this part.

The hourly ephemeris of the Moon, and the Greenwich ephemeris of Mars, Jupiter, Saturn, Uranus, and Neptune, were furnished by the office of the British *Nautical Almanac*.

The Greenwich ephemeris of Mercury, the elements of Saturn's rings, the elongations of Saturn's satellites, and the apparent places for Greenwich transit of 518 ten-day stars were furnished by the office of the *Berliner Jahrbuch*.

The conjunctions, phenomena, and configurations of Jupiter's satellites I–IV and the apparent places for Greenwich transit of 38 circumpolar stars were furnished by the office of the *Connaissance des Temps*.

The apparent places for Greenwich transit of 121 ten-day stars were furnished by the office of the *Almanaque Nautico*.

The apparent places for Greenwich transit of 47 ten-day stars were furnished by the office of the *Annuario Astronomico di Torino*.

In accordance with the recommendations of the *Congrès International des Éphémérides Astronomiques*, most of the material furnished from abroad is based upon tables prepared in the American Nautical Almanac Office. In the Introduction are mentioned the various tables upon which the different ephemerides are based.

The following computations were made by the American Nautical Almanac Office:

In Part I, the entire ephemeris of the Sun and Venus; the longitude, latitude, and horizontal parallax of the Moon; and all the hourly and daily variations for the quantities furnished from abroad except in the case of the right ascension and declination of the Moon.

In Part II, the quantities used in computing the apparent places of the stars from their mean places; the mean place list; the interpolation of the apparent places of 724 stars from transit at Greenwich to transit at Washington; the apparent places of 101 stars; the interpolation of the ephemerides of the Sun, Moon, and planets from Greenwich noon to transit at Washington; the stellar magnitudes of the planets.

In Part III, the data relating to the eclipses of the Sun and Moon; the data relating to the occultations of stars by the Moon; the ephemerides for physical observations of the Sun, Moon, Mars, and Jupiter; the elements of the illuminated disks of Mercury and Venus; the stellar magnitudes of the planets; the data concerning the satellites of Mars, Uranus, Neptune, the fifth, sixth, and seventh satellites of Jupiter, and the ninth satellite of Saturn; the diagrams of all the satellite orbits; the position angle and distance tables of the satellites of Saturn; the list of phenomena; the list of observatories with their geographical coordinates; and the tables for the determination of latitude and azimuth from observations of Polaris.

In addition, all computations made in the American Nautical Almanac Office and those received from the other offices were subjected to checks to insure absence of errors.

The personnel of the Office at the date of issue of this volume is given on page ii, and those who worked on this Ephemeris and are not now members of the force are William Auhagen and Walter C. Grebe.

J. L. JAYNE,
Captain, U. S. Navy,
Superintendent Naval Observatory.

U. S. NAVAL OBSERVATORY, *January, 1914.*

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ERRATA.

The American Ephemeris, 1913.

Page.					
677,	No. 143, Description	*for*	$3^s.6$ E.	*read*	$3^s.6$ W.

The American Ephemeris, 1914.

677,	No. 143, Description	*for*	$3^s.6$ E.	*read*	$3^s.6$ W.

The American Ephemeris, 1915.

558,	Dec. 32, Apparent Right Ascension	*for*	$5^s.67$	*read*	$5^s.65$
677,	No. 144, Description	*for*	$3^s.6$ E.	*read*	$3^s.6$ W.
698,	Table V, Lat. 58° 10′, Decl. 88° 51′ 50″	*for*	15″.8	*read*	15″.6

INTRODUCTION.

The Ephemeris for the Meridian of Greenwich, comprising Part I of this volume, has been constructed from various tables of the Sun, Moon, and planets, as stated below, and the ephemerides of these bodies for the meridian of Washington contained in Part II have been computed from the same tables.

The Ephemeris of the Sun is constructed from NEWCOMB's *Tables of the Sun, Astronomical Papers of the American Ephemeris*, Vol. VI, part 1.

The adopted value of the mean equatorial horizontal parallax of the Sun is 8″.80, *Paris Conference, May, 1896.*

The Sun's rectangular equatorial coordinates are computed from the longitudes and latitudes by the following formulæ:

$$
\begin{aligned}
X &= R \cos\lambda \\
Y &= R \sin\lambda \cos\omega - 19.3\, R\, \beta \\
Z &= R \sin\lambda \sin\omega + 44.5\, R\, \beta
\end{aligned}
$$

The reductions to mean equinox are computed by the formulæ—

$$
\begin{aligned}
\Delta X &= +\, Y \sec\omega\, \Delta\lambda \sin 1'' \\
\Delta Y &= -X \cos\omega\, \Delta\lambda \sin 1'' + Z \Delta\omega \sin 1'' + \ 9.1\, \tau R \sin(\lambda + 6^\circ) \\
\Delta Z &= -X \sin\omega\, \Delta\lambda \sin 1'' - Y \Delta\omega \sin 1'' - 21.0\, \tau R \sin(\lambda + 6^\circ)
\end{aligned}
$$

where the numerical coefficients are in units of the seventh place of decimals and

R=the Sun's distance from the Earth,
λ=the Sun's true longitude,
β=the Sun's true latitude, expressed in seconds of arc,
ω=the obliquity of the ecliptic,
$\Delta\lambda$=the reduction of longitude for precession and nutation from the beginning of the Besselian fictitious year,
$\Delta\omega$=the reduction of the mean to the apparent obliquity,
τ=the fraction of the year since the beginning of the Besselian fictitious year.

The longitude, latitude, and parallax of the Moon are derived from HANSEN's *Tables de la Lune* (London, 1857), the mean longitude being corrected as in previous years, beginning with the volume for the year 1883. The statement concerning these corrections which is contained in the volumes from 1883 to 1911, inclusive, is erroneous, in that they have not been computed strictly in accordance with the formula in NEWCOMB's *Researches on the Motion of the Moon*, part 1, page 268, *Washington Observations*, 1875, Appendix II. That formula is,

$$-1''.14 - 29''.17\ \mathrm{T} - 3''.86\ \mathrm{T}^2 - \mathrm{V}_2 - 0''.09 \sin \mathrm{A} - 15''.49 \cos \mathrm{A},$$

while the expression actually used is,

$$-1''.14 - 29''.17\ \mathrm{T} - 3''.76\ \mathrm{T}^2 - \mathrm{V}_2 - 15''.49 \cos \mathrm{A}.$$

In these formulæ T is the time in units of 100 years reckoned from 1800.

The ephemerides of Mercury, Venus, and Mars are derived from NEWCOMB's tables of these planets, *Astronomical Papers of the American Ephemeris*, Vol. VI, parts 2, 3, and 4.

The ephemerides of Jupiter and Saturn are derived from the tables constructed in this office by George W. Hill, *Astronomical Papers of the American Ephemeris*, Vol. VII, parts 1 and 2.

The ephemerides of Uranus and Neptune are derived from Newcomb's tables of these planets, *Astronomical Papers of the American Ephemeris*, Vol. VII, parts 3 and 4.

The nutation used in computing the ephemerides of the Sun, Moon, and planets has been taken from Tables XXXII and XXXIII of Newcomb's *Tables of the Sun, Astronomical Papers of the American Ephemeris*, Vol. VI, part 1. The formulæ from which this nutation is computed are as follows, the time interval T being expressed in units of 100 years, reckoned from 1900. See *Tables of the Sun*, page 26.

$$\begin{aligned}\delta\psi = &-(17''.234+0''.017\ \mathrm{T})\sin \text{☊}\\ &+\ 0''.209\sin 2\,\text{☊}\\ &-\ 1''.257\sin 2\,\mathrm{L}\\ &-\ 0''.049\sin(3\,\mathrm{L}+78^\circ.7)\\ &+\ 0''.110\sin(\mathrm{L}+75^\circ.3)\end{aligned}$$

$$\begin{aligned}\delta\varepsilon = &+9''.214\cos \text{☊}\\ &-0''.090\cos 2\,\text{☊}\\ &+0''.546\cos 2\,\mathrm{L}\\ &+0''.021\cos(3\,\mathrm{L}+78^\circ.7)\\ &-0''.009\cos(\mathrm{L}-78^\circ.7)\end{aligned}$$

The formulæ for the nutation used in computing the Besselian and Independent Star Numbers are as follows:

Terms of Long Period.

$$\begin{aligned}\delta\psi = &-(17''.234+0''.017\ \mathrm{T})\sin \text{☊}\\ &+\ 0''.209\sin 2\,\text{☊}\\ &-\ 1''.272\sin 2\,\mathrm{L}\\ &+\ 0''.126\sin(\mathrm{L}-\Gamma)\\ &-\ 0''.050\sin(3\,\mathrm{L}-\Gamma)\\ &+\ 0''.021\sin(\mathrm{L}+\Gamma)\\ &+\ 0''.012\sin(2\,\mathrm{L}-\text{☊})\end{aligned}$$

$$\begin{aligned}\delta\varepsilon = &+(9''.210+0''.0009\ \mathrm{T})\cos \text{☊}\\ &-\ 0''.090\cos 2\,\text{☊}\\ &+\ 0''.552\cos 2\,\mathrm{L}\\ &+\ 0''.022\cos(3\,\mathrm{L}-\Gamma)\\ &-\ 0''.009\cos(\mathrm{L}+\Gamma)\\ &-\ 0''.007\cos(2\,\mathrm{L}-\text{☊})\end{aligned}$$

Terms of Short Period.

$$\begin{aligned}&-0''.204\sin 2\,\text{☾}\\ &+0''.011\sin(\text{☾}+\Gamma')\\ &+0''.068\sin(\text{☾}-\Gamma')\\ &-0''.034\sin(2\,\text{☾}-\text{☊})\\ &-0''.026\sin(3\,\text{☾}-\Gamma')\\ &+0''.015\sin(\text{☾}-2\,\mathrm{L}+\Gamma')\\ &+0''.006\sin 2\,(\text{☾}-\mathrm{L})\end{aligned}$$

$$\begin{aligned}&+0''.088\cos 2\,\text{☾}\\ &+0''.018\cos(2\,\text{☾}-\text{☊})\\ &+0''.011\cos(3\,\text{☾}-\Gamma')\\ &-0''.005\cos(\text{☾}+\Gamma')\end{aligned}$$

The meaning of the symbols used and the manner in which these latter formulæ have been employed in computing the ephemerides of the stars are explained on pages 200 and 201. The slight discrepancy between the terms in 2 L in these two sets of formulæ is due to the correction of an error in the first set. See *Bulletin Astronomique*, 1898, Vol. XV, page 244.

The list of 825 stars contained in Part II has been selected from Newcomb's *Catalogue of Fundamental Stars, Astronomical Papers of the American Ephemeris*, Vol. VIII, part 2.

In general, the names of the stars are the same as in Newcomb's Suggested List of Fundamental Stars, except that the Flamsteed number has been omitted in all cases where Greek or italic letters are available. In some cases the constellation and number of the uranometries of Heis or Gould have been used. In all such cases, H^1 or the letter G precedes the constellation name, as, for example, 5 H^1. Cassiopeiæ and 38 G. Horologii.

The magnitudes of the stars have, with a few exceptions, been taken from *Annals of the Harvard College Observatory*, Vol. L, 1908.

The spectral classification has been furnished by the Harvard College Observatory. The notation is that of *Annals of Harvard College Observatory*, Vol. LVI.

The mean places, annual variations, and annual proper motions of the stars have been taken from Newcomb's Catalogue, except that those of ε Hydri, 38 G. Horologii, and π Centauri have been taken from *Veroeffentlichungen des Koeniglichen Astronomischen Rechen-Instituts zu Berlin*, 1907, No. 33.

The values of $\Delta\alpha$ and $\Delta\delta$ which are given for the companions to the stars γ Andromedæ, α^1 Crucis, ζ^1 Ursæ Majoris and 61 Cygni, have been taken from Boss's *Preliminary General Catalogue*, and those for α^2 Geminorum from Doberck's elements given in the *Astronomische Nachrichten*, 1904, vol. 166, page 145.

The formulæ for the computation of the Besselian and Independent Star Numbers are given on page 200, the coefficients being those given by Newcomb in *Bulletin Astronomique*, 1898, Vol. XV, page 241.

The terms of short period of the nutation, depending on the Moon's mean longitude, have been computed from the formulæ for these terms given above.

The method by which the right ascensions and declinations of the stars interpolated from the 10-day ephemerides are corrected for the effect of these short-period terms is given on page 201.

According to the formulæ on pages 200 and 201 the star constants $a, b, c, d, a', b', c', d'$ are computed for each star from its mean place at the beginning of the year, but if strict accuracy is required they should be computed from the star's mean place at date, and the following second-order terms should be added to the usual expressions for the reduction from mean to apparent place, namely—

To $\alpha-\alpha_0$

$$\begin{array}{l}
\overset{s}{} \\
\left.\begin{array}{l} +0.000\,003\;\tau^2\sin\alpha \\ -0.000\,149\;\tau^2\cos\alpha \end{array}\right\}\tan\delta \\
\left.\begin{array}{l} -0.000\,0650\;\tau^2\sin 2\alpha \\ +0.000\,0103\;\sin 2\,\text{☊}\;\cos 2\alpha \\ -0.000\,0107\;\cos 2\,\text{☊}\;\sin 2\alpha \end{array}\right\}\tan^2\delta \\
\left.\begin{array}{l} +0.000\,0620\;\sin 2\odot\;\cos 2\alpha \\ -0.000\,0622\;\cos 2\odot\;\sin 2\alpha \end{array}\right\}\sec^2\delta \\
\left.\begin{array}{l} +0.000\,0513\;\sin(\odot+\text{☊})\;\cos 2\alpha \\ -0.000\,0507\;\cos(\odot+\text{☊})\;\sin 2\alpha \\ +0.000\,0097\;\sin(\odot-\text{☊})\;\cos 2\alpha \\ -0.000\,0053\;\cos(\odot-\text{☊})\;\sin 2\alpha \end{array}\right\}\tan\delta\sec\delta
\end{array}$$

To $\delta-\delta_0$

$$\begin{array}{l}
'' \\
\left.\begin{array}{l} +0.000\,975\;\tau^2\sin^2\alpha \\ -0.000\,023\;\cos 2\,\text{☊} \\ -0.000\,080\;\cos 2\,\text{☊}\;\cos 2\alpha \\ -0.000\,077\;\sin 2\,\text{☊}\;\sin 2\alpha \\ +0.000\,040\;\cos 2\odot \\ -0.000\,467\;\cos 2\odot\;\cos 2\alpha \\ -0.000\,465\;\sin 2\odot\;\sin 2\alpha \end{array}\right\}\tan\delta \\
\left.\begin{array}{l} -0.000\,039\;\cos(\odot+\text{☊}) \\ -0.000\,380\;\cos(\odot+\text{☊})\;\cos 2\alpha \\ -0.000\,385\;\sin(\odot+\text{☊})\;\sin 2\alpha \\ -0.000\,380\;\cos(\odot-\text{☊}) \\ -0.000\,040\;\cos(\odot-\text{☊})\;\cos 2\alpha \\ -0.000\,072\;\sin(\odot-\text{☊})\;\sin 2\alpha \end{array}\right\}\sin\delta\tan\delta
\end{array}$$

These terms are negligible for stars whose declination is numerically less than 80°, but in computing the apparent places given in the American Ephemeris they have been applied whenever sensible.

The *apparent* places of seven stars have been corrected for the effect of annual parallax. These stars, with the adopted values of the annual parallax, are—

	''		''
τ Ceti	0.31	α Centauri	0.75
ε Eridani	0.32	α Aquilæ (Altair) . .	0.23
α Canis Majoris (Sirius) . .	0.38	61 Cygni	0.30
α Canis Minoris (Procyon) . .	0.33		

The *apparent* places of α Canis Majoris (Sirius), α Canis Minoris (Procyon), and α^2 Centauri have been corrected for the effect of orbital motion. Auwers's elements were used for Sirius and Procyon, and See's elements for α^2 Centauri. The values of these corrections are given on pages 98 and 99 of *Veroeffentlichungen des Koeniglichen Astronomischen Rechen-Instituts zu Berlin*, 1907, No. 33, but those for Sirius and Procyon need an additional correction to refer them to the center of the orbit before they are applicable to the mean places taken from Newcomb's Fundamental Catalogue. These additional corrections for Sirius and Procyon were omitted in the *Star List of the American Ephemeris* [*Supplement to the American Ephemeris and Nautical Almanac*] for 1910 and 1911, and in the *American Ephemeris and Nautical Almanac* for 1912 and 1913. The values of the corrections for the three stars are—

	Sirius.		Procyon.		α^3 Centauri.	
	1916.0	1917.0	1916.0	1917.0	1916.0	1917.0
$\Delta\alpha$	$-0^s.142$	$-0^s.143$	$-0^s.062$	$-0^s.062$	$+0^s.658$	$+0^s.647$
$\Delta\delta$	$-0''.46$	$-0''.59$	$-0''.08$	$+0''.05$	$+6''.25$	$+5''.98$

These corrections have not been applied to the mean places as published in this volume.

The stars occulted by the Moon have been selected from the *Catalogue of Zodiacal Stars* contained in Vol. VIII, part 3, *Astronomical Papers of the American Ephemeris*, and the mean places for 1916.0 have been derived from the same catalogue.

In Part III the elements of eclipses of the Sun and occultations of stars by the Moon are given in accordance with Bessel's method, the special forms employed being a modification of those developed in Chauvenet's *Spherical and Practical Astronomy*.

In the computation of the elements of Eclipses, the following corrections to the longitude, latitude, and parallax of the Moon, deduced by Newcomb from recent observations of occultations of stars by the Moon, *Astronomical Papers of the American Ephemeris*, Vol. IX, part 1, have been applied. These corrections have been assumed in each case to be constant during the eclipse.

G. M. T.			δv	δb	$\delta\pi$
1916			$''$	$''$	$''$
Jan.	19^d	21^h	+6.4	+1.0	+0.34
Feb.	3	4	+7.5	−0.3	+0.42
July	14	17	+6.2	−0.1	+0.43
July	29	14	+8.3	+1.0	+0.34
Dec.	24	8	+7.0	0.0	+0.42

The elongations of the satellites of Mars are derived from elements given by H. Struve in *Sitzungsberichte der Königlich Preussischen Akademie der Wissenschaften*, 1911, page 1073.

The conjunctions and phenomena of Jupiter's four brighter satellites are derived from Sampson's tables. The configurations are derived from a continuation of Damoiseau's tables by M. Pottier.

The elongations of the Vth satellite of Jupiter are derived from unpublished elements deduced from the observations of Barnard.

The differential coordinates of Jupiter's VIth and VIIth satellites are derived from elements and tables given in *Lick Observatory Bulletin*, 1906, IV, No. 112, and in *Astronomische Nachrichten*, 1907, Vol. 174, page 359, The elongations and conjunctions of the satellites and the positions of the rings of Saturn are derived from elements given by H. Struve in *Observations de Poulkova,* Supplement 1, St. Petersburg, 1888; *Publications de Poulkovo,* Second Series, Vol. XI, St. Petersburg, 1898; with corrections communicated by H. Struve to the *Berliner Jahrbuch.* The differential coordinates of Phœbe are derived from elements and tables given in the *Annals of Harvard College Observatory,* 1905, Vol. LIII, No. VI.

The apparent outer dimensions (a and b) of the rings of Saturn are also according to Struve; the relative dimensions of the rings are computed from Bessel's data, except those for the dusky ring, which are based on the observations of various astronomers.

The elongations of Ariel and Umbriel, the inner satellites of Uranus, are derived from the data of Newcomb's *Uranian and Neptunian Systems, Washington Observations,* 1873, Appendix I. The elongations of Titania and Oberon, the outer satellites of Uranus, are derived from elements given by H. Struve in *Abhandlungen der K. Preussischen Akademie der Wissenschaften,* 1912.

The elongations of the satellite of Neptune are derived from elements given by A. Hall in the *Astronomical Journal,* 1898, Vol. XIX, page 65.

The adopted apparent semidiameter of the Sun at the Earth's mean distance is 16′ 1″.50, while in the computation of eclipses the value given by Auwers in the *Astronomische Nachrichten,* 1891, Vol. 128, page 367, is employed, viz., 15′ 59″.63.

In the computation of the ephemeris for physical observations of the Sun, the following elements by Carrington have been used:

Inclination of the Sun's equator to the ecliptic	7° 15′
Longitude of the asceding node of the Sun's equator on the ecliptic	73° 40′+50″.25 ($t-1850$)
Sidereal period of rotation (mean solar days)	25^d.38

The apparent semidiameter of the Moon is computed from the Moon's equatorial horizontal parallax, π, by the formula,

$$S=0.272\,506\,\pi+1''.50$$

where the constant 0.272 506 is based on data from occultations given by J. Peters in the *Astronomische Nachrichten,* 1895, Vol. 138, page 147; and the constant 1″.50 is added to cover the average effect of irradiation.

The value of the Moon's semidiameter employed in the computation of eclipses is computed from the formula,

$$\sin S=0.272\,274 \sin \pi$$

In the computation of the ephemeris for physical observations of the Moon, the following notation and formulæ have been used, the value of I and the formulæ for physical libration being those given by F. Hayn in *Abhandlungen der K. Sächsischen Gesell. der Wissenschaften,* Vols. 29 and 30, 1904, 1907:

I=the inclination of the Moon's mean equator to the ecliptic (=1° 32′.1),

Ω=the longitude of the ascending node of the Moon's orbit, or the longitude of the descending node of the Moon's mean equator,

C=the angle at the center of the Moon's disk made by a lunar meridian with the circle of declination, counted from north to east,

λ, β, α, δ=the geocentric longitude, latitude, right ascension, and declination of the Moon,

i=the inclination of the Moon's mean equator to the Earth's true equator,
Δ=the distance on the Moon's mean equator from its ascending node on the Earth's true equator to its ascending node on the ecliptic,
$☊'$=the distance along the Earth's true equator from the true equinox to the ascending node of the Moon's mean equator,
☾=the Moon's mean longitude, referred to the mean equinox,
g'=the Earth's mean anomaly,
g=the Moon's mean anomaly,
ω=the angular distance of the perigee of the Moon's orbit from its ascending node on the ecliptic,
b, l=the optical librations in latitude and longitude, respectively,
δb, δl=the physical librations in latitude and longitude, respectively,
$b+\delta b$=the Moon's geocentric libration in latitude=the Earth's selenographic latitude,
$l+\delta l$=the Moon's geocentric libration in longitude=the Earth's selenographic longitude,
δC=the physical libration of C,

$$\mu = -0'.617 \sin 2\,(☊-\lambda),$$
$$A = \sin I \cos\,(☊-\lambda),$$
$$\tan B = \tan I \sin\,(☊-\lambda),$$
$$\lambda' = \lambda+\mu+Ab,$$
$$b = B-\beta,$$
$$l = \lambda' - ☾,$$
$$\sin C' = \sin i\,\frac{\cos\,(\lambda'+\Delta-☊)}{\cos\delta} = -\sin i\,\frac{\cos\,(\alpha-☊')}{\cos b},$$
$$\delta b = +108'' \sin\,(\omega+l)+37'' \sin\,(\omega-l)-11'' \sin\,(g+\omega-l),$$
$$\delta l = +12'' \sin g-59'' \sin g'-18'' \sin 2\omega,$$
$$-[108'' \cos\,(\omega+l)-37'' \cos\,(\omega-l)+11'' \cos\,(g+\omega-l)] \tan b,$$
$$\delta C = -[108'' \cos\,(\omega+l)-37'' \cos\,(\omega-l)+11'' \cos\,(g+\omega-l)] \sec b,$$
$$C = C'+\delta C.$$

The Sun's selenographic latitude and longitude have been computed from formulæ the same as those given above except that the heliocentric coordinates of the Moon have been substituted for the geocentric coordinates.

The following elements have been used in computing the ephemerides for physical observations of the planets Mars and Jupiter:

Position of north pole of Mars		$\alpha=21^h\ 10^m\ 0^s + 1^s.565(t-1905)$ $\delta=54°\ 30'\ 0''+12''.60(t-1905)$
Position of north pole of Jupiter		$\alpha=17^h\ 52^m\ 0^s.84+0^s.247(t-1910)$ $\delta=64°\ 33'\ 34''.6-\ 0''.60(t-1910)$
Rotation period of Mars		$24^h\ 37^m\ 22^s.65$
Rotation period of Jupiter	System I.	$9^h\ 50^m\ 30^s.004$
	System II.	$9^h\ 55^m\ 40^s.632$
Longitude of Central Meridian of Mars, May 15, 1897, Greenwich Mean Noon		52°.01
Longitude of Central Meridian of Jupiter (System I.), July 14, 1897, Greenwich Mean Noon		47°.31
Longitude of Central Meridian of Jupiter (System II.), July 14, 1897, Greenwich Mean Noon		96°.58

The position of the north pole of Mars is as given by LOWELL and CROMMELIN (see *Monthly Notices R. A. S.*, 1905, Vol. 66, page 56), while that of the north pole of Jupiter has been deduced from the position given by DAMOISEAU for 1750 (see *Tables Écliptiques des Satellites de Jupiter*, page (1)). The rotation periods of Mars and of Jupiter and the longitudes of the central meridians are according to MARTH (see *Monthly Notices R. A. S.*, 1896, Vol. 56, pages 395–403 and 517–524). The longitude of the Great Red Spot and the time of its transit across the Central Meridian given in the volumes for 1913 and 1914 have been replaced by those of System II. of Marth. This change has been made in view of the following facts: The Paris Conference of October, 1911, assigned to the office of the American Ephemeris and Nautical Almanac the preparation of the ephemerides for the physical observations of the planets; a general desire exists that the use of System II. of Marth should not be discontinued; and the position of the Great Red Spot during the opposition of 1912 was about 70° from the place predicted from the elements adopted in the *American Ephemeris and Nautical Almanac* for 1913.

The adopted semidiameters of the planets, with the authority for each, are given on page xix. Their stellar magnitudes have been computed from formulæ given by G. Mueller in *Publicationen des Astrophysikalischen Observatoriums zu Potsdam*, 1893, Vol. 8, page 366.

In the list of observatories the positions given in this volume have been thoroughly revised, and in each case the authority from which they are derived is given. The latitudes given are in most cases astronomical. In some instances they have been determined by geodetic triangulation from other points. The reductions from geographic to geocentric latitude, $\varphi' - \varphi$, and the distance from the center of the earth, ρ, are computed from the formulæ on page xviii, using the flattening $\frac{1}{297}$ obtained by John F. Hayford in *Supplementary Investigation in 1909 of the Figure of the Earth and Isostasy*, U. S. Coast and Geodetic Survey, 1910, and adopted by the *Paris Conference*, October, 1911.

ANNIVERSARIES AND FESTIVALS, 1916.

New Year's Day	Saturday,	Jan.	1.
Epiphany	Thursday,	Jan.	6.
Lincoln's Birthday	Saturday,	Feb.	12.
Septuagesima Sunday	Sunday,	Feb.	20.
Washington's Birthday	Tuesday,	Feb.	22.
Quinquagesima (Shrove Sunday)	Sunday,	Mar.	5.
Ash Wednesday	Wednesday,	Mar.	8.
Palm Sunday	Sunday,	Apr.	16.
First Day of Passover	Tuesday,	Apr.	18.
Good Friday	Friday,	Apr.	21.
Easter Sunday	Sunday,	Apr.	23.
Rogation Sunday	Sunday,	May	28.
Memorial Day	Tuesday,	May	30.
Ascension Day (Holy Thursday)	Thursday,	June	1.
Hebrew Pentecost (Shebuoth)	Wednesday,	June	7.
Pentecost (Whit Sunday)	Sunday,	June	11.
Trinity Sunday	Sunday,	June	18.
Corpus Christi	Thursday,	June	22.
Independence Day	Tuesday,	July	4.
Labor Day (except in certain States)	Monday,	Sept.	4.
Hebrew New Year (Rosh Hashanah)	Thursday,	Sept.	28.
Day of Atonement (Yom Kippur)	Saturday,	Oct.	7.
First Day of Tabernacle (Sucoth)	Thursday,	Oct.	12.
Election Day	Tuesday,	Nov.	7.
Thanksgiving Day	Thursday,	Nov.	30.
First Sunday in Advent	Sunday,	Dec.	3.
Christmas Day	Monday,	Dec.	25.

CHRONOLOGICAL ERAS AND CYCLES.

CHRONOLOGICAL ERAS.

E YEAR 1916, WHICH COMPRISES THE LATTER PART OF THE 140TH AND THE BEGINNING OF THE 141ST YEAR OF THE INDEPENDENCE OF THE UNITED STATES OF AMERICA, CORRESPONDS TO—

The year 6629 of the Julian period;
" 7424–7425 of the Byzantine era, the year 7425 commencing on September 1;
" 5676–5677 of the Jewish era, the year 5677 commencing on September 28, or, more exactly, at sunset on September 27;
" 2669 since the foundation of Rome, according to Varro;
" 2663 since the beginning of the era of Nabonassar, which has been assigned to Wednesday, the 26th of February of the 3967th year of the Julian Period; corresponding in the notation of chronologists, to the 747th, and, in the notation of astronomers, to the 746th year before the birth of Christ;
" 2692 of the Olympiads, or the fourth year of the 673d Olympiad, commencing in July, 1916, if we fix the era of the Olympiads at 775½ years before Christ, or near the beginning of July of the year 3938 of the Julian period;
" 2228 of the Grecian era, or the era of the Seleucidæ, which began near the vernal equinox of the year, −311 = B. C. 312, = 4402 of the Julian Period;
" 1632 of the era of Diocletian;
" 2576 of the Japanese era and to the 5th year of the period entitled Taisho.

The year 1335 of the Mohammedan era, or the era of the Hegira, begins the 28th day of October, 1916.

The first day of January of the year 1916 is the 2,420,864th day since the ommencement of the Julian Period.

CHRONOLOGICAL CYCLES.

ominical Letter	BA	Solar Cycle	21
pact	26	Roman Indiction . .	14
unar Cycle or Golden Number	17	Julian Period	6629

ASTRONOMICAL CONSTANTS.

	″	
Solar Parallax	8.80	Paris Conference.
Constant of Nutation	9.21	
Constant of Aberration	20.47	
General Precession	$50''.2564+0''.000\,222(t-1900)$	Newcomb.
Obliquity of the Ecliptic	$23^\circ\,27'\,8''.26-0''.4684(t-1900)$	
Equatorial Horizontal Parallax of the Moon	$57'\,2''.63$[*]	(Newcomb)

Mean distance Earth to Moon 384 411 kilometers=238 862 miles, or 60.2678 radii.

Mean distance Earth to Sun 149 504 201 kilometers=92 897 416 statute miles.

Velocity of light 299 860 kilometers=186 324 statute miles per second (Newcomb and Michelson).

Light travels unit distance in $498^{s}.580$.

Gaussian Gravitation Constant, [†]$k=0.017\,202\,099=3\,548''.187\,61$.

Acceleration in one second due to gravity,	$g=\overset{\text{m}}{9.8060}-\overset{\text{m}}{0.0260}\cos 2\varphi-\frac{2h}{R}g$.[‡]	Helmert.
Length of seconds pendulum,	$l=\overset{\text{m}}{0.993\,549}-\overset{\text{m}}{0.002\,631}\cos 2\varphi-\frac{2h}{R}l$ [‡]	

Length of the year:

	d	
Tropical (ordinary)	$365.242\,198\,79-0.000\,000\,0614\,(t-1900)$	Newcomb.
Sidereal	$365.256\,360\,42+0.000\,000\,0011\,(t-1900)$	
Anomalistic	$365.259\,641\,34+0.000\,000\,0304\,(t-1900)$	
Eclipse	$346.620\,000\quad+0.000\,000\,36\quad(t-1900)$	

Length of the month:

	d	d	h	m	s	
Synodical (ordinary)	29.530 588=	29	12	44	2.8	Hansen.
Tropical	27.321 582=	27	7	43	4.7	
Sidereal	27.321 661=	27	7	43	11.5	
Anomalistic	27.554 550=	27	13	18	33.1	
Nodical	27.212 219=	27	5	5	35.7	

Length of the day:

	h	m	s	
Sidereal	23	56	4.091	of mean solar time.
Mean Solar	24	3	56.555	of sidereal time.

Dimensions of the Earth (Hayford's Spheroid of 1909):

Equatorial Radius, $a=6378.388$ kilometers or 3963.34 statute miles.

Polar Radius, $b=6356.909$ " or 3949.99 " "

Flattening, $\frac{a-b}{a}=\frac{1}{297.0}$

Logarithm of the eccentricity $\frac{\sqrt{a^2-b^2}}{a}=\log e=8.913\,804$

Logarithm radius$=\log\rho=9.999\,2695+0.000\,7324\cos 2\varphi-0.000\,0019\cos 4\varphi$.

Reduction from geographic latitude φ to geocentric latitude φ',

$$\varphi'-\varphi=-11'\,35''.66\sin 2\varphi+1''.17\sin 4\varphi.$$

1 meter=3.280 8333 feet. 1 foot=0.304 8006 meters.

1 statute mile=0.868 362 nautical or geographical miles.

1 nautical mile=1.151 594 statute miles.

[*] Used in the computation of eclipses. The parallax used in the computation of the ephemeris of the Moon contained in this volume is $57'\,2''.23$ (Hansen).

[†] k^2 is the acceleration due to the Sun's attraction at the mean distance of the Earth from the Sun, which is also the astronomical unit of distance, the unit of time being one mean solar day.

[‡] φ=latitude, h=elevation above sea level in meters, and $\log R=6.80416$.

NOTE.—The above values of $\log\rho$ and $\varphi'-\varphi$ were computed with the eccentricity that results from assuming that the flattening of the earth is exactly $\frac{1}{297}$.

ASTRONOMICAL CONSTANTS.

SEMIDIAMETERS OF THE SUN, MOON, AND PLANETS.

Name.	At Unit Distance. ′ ″	At Mean Least Distance. ″	In Kilometers.	In Statute Miles.	Authority.
Sun	15 59.63	. .	695 553.46	432 196.01	Auwers.
Moon	15 32.58*	. .	1 738.02	1 079.96	Newcomb.
Mercury	3.34	5.45	2 420.89	1 504.27	Le Verrier.
Venus	8.55	30.90	6 197.18	3 850.74	Peirce.
Mars	5.05	9.64	3 660.32	2 274.42	Peirce.
Jupiter (Equatorial)	1 40.20	23.84	72 626.64	45 128.01	Am. Eph.
Jupiter (Polar)	1 34.12	22.40	68 219.76	42 389.71	Peirce.
Saturn (Equatorial)	1 24.88	9.94	61 522.45	38 228.20	Barnard.
Saturn (Polar)	1 17.47	9.07	56 151.56	34 890.89	Barnard.
Uranus	33.52	1.84	24 295.86	15 096.72	Am. Eph.
Neptune	38.66	1.33	28 021.42	17 411.67	Am. Eph.

ELEMENTS OF THE PLANETARY ORBITS FOR THE EPOCH 1916—January 1^d G. M. T.

Name.	Mean Distance.	Sidereal Period in Tropical Years.	Sidereal Mean Daily Motion. ″	Synodic Period in Tropical Years.	Eccentricity.
☿ Mercury	0.387 099	0.240 85	14 732.420	0.317 26	0.205 6175
♀ Venus	0.723 331	0.615 21	5 767.670	1.598 72	0.006 8131
⊕ Earth	1.000 000	1.000 04	3 548.193	. . . .	0.016 7443
♂ Mars	1.523 688	1.880 89	1 886.519	2.135 39	0.093 3234
♃ Jupiter	5.202 803	11.862 23	299.128	1.092 11	0.048 3636
♄ Saturn	9.538 843	29.457 72	120.455	1.035 18	0.055 8344
⛢ Uranus	19.190 978	84.015 29	42.23	1.012 09	0.047 0894
♆ Neptune	30.070 672	164.788 29	21.53	1.006 14	0.008 5434

Name.	Inclination to the Ecliptic. ° ′ ″	Mean Longitude of the Node. ° ′ ″	Mean Longitude of the Perihelion. ° ′ ″	Mean Longitude at the Epoch. ° ′ ″	Logarithm of Mass in Unit of Sun's Mass.
☿ Mercury	7 0 11.4	47 20 8.1	76 8 54.9	334 1 49.48	3.221 8487−10
♀ Venus	3 23 37.6	75 55 25.1	130 23 20.7	345 50 27.48	4.389 3398−10
⊕ Earth	. . . . . .	. . . . .	101 29 45.3	99 49 10.97	4.482 2896−10
♂ Mars	1 51 1.0	48 54 33.7	334 30 46.8	116 25 10.21	3.509 5499−10
♃ Jupiter	1 18 28.3	99 35 58.8	12 58 9.8	3 51 29.51	6.979 9082−10
♄ Saturn	2 29 30.0	112 55 23.2	91 24 7.9	102 19 36.17	6.455 7335−10
⛢ Uranus	0 46 21.9	73 34 14.6	169 18 16.4	312 8 48.45	5.640 7528−10
♆ Neptune	1 46 39.8	130 51 17.2	43 53 43.7	120 12 12.53	5.705 5338−10

The elements of the four inner planets are derived from those given by NEWCOMB in Vol. VI of the *Astronomical Papers of the American Ephemeris*, and are the same as those used in computing the ephemerides of these planets. Those of Jupiter, Saturn, Uranus, and Neptune are taken from Vol. VII of the *Astronomical Papers* for the epoch of the tables. They are reduced to 1916 by applying LE VERRIER's variations, and can not be regarded as being strictly identical with the elements used in computing the ephemerides of those planets in this volume.

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* At mean distance. See *Ast. Papers Am. Eph.*, Vol. IX, p. 39. For the values of the semidiameter used in this volume see page xiii.

SYMBOLS AND ABBREVIATIONS.

SIGNS OF THE PLANETS, ETC.

☉	The Sun.	♂	Mars.
☾	The Moon.	♃	Jupiter.
☿	Mercury.	♄	Saturn.
♀	Venus.	♅	Uranus.
⊕	The Earth.	♆	Neptune.

SIGNS OF THE ZODIAC.

Spring Signs.	1.	♈	Aries.	Autumn Signs.	7.	♎	Libra.
	2.	♉	Taurus.		8.	♏	Scorpius.
	3.	♊	Gemini.		9.	♐	Sagittariu
Summer Signs.	4.	♋	Cancer.	Winter Signs.	10.	♑	Capricorn
	5.	♌	Leo.		11.	♒	Aquarius.
	6.	♍	Virgo.		12.	♓	Pisces.

ASPECTS.

☌	Conjunction, or having the same Longitude or Right Ascension.
□	Quadrature, or differing ±90° in Longitude or Right Ascension.
☍	Opposition, or differing 180° in Longitude or Right Ascension.

ABBREVIATIONS.

☊	Ascending Node.	°	Degrees.
☋	Descending Node.	′	Minutes of Arc.
N.	North.	″	Seconds of Arc.
S.	South.	^{h}	Hours.
E.	East.	^{m}	Minutes of Time.
W.	West.	^{s}	Seconds of Time.

PART I.

ASTRONOMICAL EPHEMERIS FOR THE MERIDIAN OF GREENWICH.

SUN, 1916.

FOR GREENWICH MEAN NOON.

Date.	Day of the Week.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Semi-diameter.	Hor. Par.	Equation of Time. App.—Mean.	Var. per Hour.	Siderea or Righ sion of Su
		h m s	s	° ′ ″	″	′ ″	″	m s	s	h m
Jan. 1	Sa	18 42 27.14	11.054	−23 5 35.0	+11.21	16 17.84	8.95	− 3 10.95	−1.198	18 39
2	Su	18 46 52.30	11.042	23 0 52.1	12.36	16 17.84	8.95	3 39.55	1.186	18 43
3	Mo	18 51 17.16	11.028	22 55 41.5	13.51	16 17.84	8.95	4 7.85	1.172	18 47
4	Tu	18 55 41.67	11.013	22 50 3.5	14.65	16 17.84	8.95	4 35.81	1.157	18 51
5	We	19 0 5.81	10.997	22 43 58.2	15.78	16 17.83	8.95	5 3.39	1.140	18 55
6	Th	19 4 29.53	10.979	−22 37 25.8	+16.91	16 17.82	8.95	− 5 30.55	−1.122	18 58
7	Fr	19 8 52.80	10.960	22 30 26.6	18.02	16 17.80	8.95	5 57.27	1.103	19 2
8	Sa	19 13 15.60	10.939	22 23 0.7	19.12	16 17.78	8.95	6 23.50	1.083	19 6
9	Su	19 17 37.88	10.917	22 15 8.4	20.22	16 17.76	8.95	6 49.23	1.061	19 10
10	Mo	19 21 59.62	10.894	22 6 49.9	21.31	16 17.73	8.95	7 14.41	1.038	19 14
11	Tu	19 26 20.80	10.870	−21 58 5.6	+22.38	16 17.70	8.95	− 7 39.03	−1.014	19 18
12	We	19 30 41.39	10.845	21 48 55.6	23.45	16 17.66	8.95	8 3.06	0.988	19 22
13	Th	19 35 1.36	10.819	21 39 20.2	24.50	16 17.62	8.95	8 26.47	0.962	19 26
14	Fr	19 39 20.70	10.792	21 29 19.7	25.54	16 17.57	8.95	8 49.25	0.935	19 30
15	Sa	19 43 39.39	10.765	21 18 54.5	26.57	16 17.52	8.95	9 11.38	0.908	19 34
16	Su	19 47 57.40	10.737	−21 8 4.7	+27.58	16 17.46	8.95	− 9 32.84	−0.880	19 38
17	Mo	19 52 14.73	10.708	20 56 50.7	28.58	16 17.39	8.95	9 53.61	0.851	19 42
18	Tu	19 56 31.36	10.678	20 45 12.8	29.57	16 17.32	8.94	10 13.69	0.821	19 46
19	We	20 0 47.28	10.648	20 33 11.3	30.55	16 17.24	8.94	10 33.05	0.791	19 50
20	Th	20 5 2.47	10.617	20 20 46.5	31.51	16 17.16	8.94	10 51.68	0.761	19 54
21	Fr	20 9 16.92	10.586	−20 7 58.8	+32.46	16 17.07	8.94	−11 9.57	−0.730	19 58
22	Sa	20 13 30.62	10.555	19 54 48.5	33.40	16 16.97	8.94	11 26.72	0.699	20 2
23	Su	20 17 43.57	10.524	19 41 15.8	34.32	16 16.87	8.94	11 43.11	0.667	20 6
24	Mo	20 21 55.76	10.492	19 27 21.2	35.23	16 16.76	8.94	11 58.74	0.635	20 9
25	Tu	20 26 7.18	10.460	19 13 5.0	36.12	16 16.65	8.94	12 13.60	0.603	20 13
26	We	20 30 17.82	10.427	−18 58 27.5	+37.00	16 16.53	8.94	−12 27.68	−0.571	20 17
27	Th	20 34 27.68	10.395	18 43 29.2	37.86	16 16.41	8.94	12 40.99	0.538	20 21
28	Fr	20 38 36.76	10.362	18 28 10.3	38.71	16 16.28	8.94	12 53.51	0.505	20 25
29	Sa	20 42 45.05	10.329	18 12 31.2	39.54	16 16.15	8.93	13 5.24	0.472	20 29
30	Su	20 46 52.54	10.296	17 56 32.4	40.35	16 16.02	8.93	13 16.18	0.439	20 33
31	Mo	20 50 59.23	10.262	−17 40 14.3	+41.15	16 15.88	8.93	−13 26.31	−0.406	20 37
Feb. 1	Tu	20 55 5.11	10.228	17 23 37.2	41.93	16 15.74	8.93	13 35.64	0.372	20 41
2	We	20 59 10.19	10.194	17 6 41.6	42.69	16 15.59	8.93	13 44.16	0.338	20 45
3	Th	21 3 14.45	10.160	16 49 27.9	43.44	16 15.44	8.93	13 51.86	0.304	20 49
4	Fr	21 7 17.89	10.126	16 31 56.5	44.17	16 15.28	8.93	13 58.74	0.270	20 53
5	Sa	21 11 20.51	10.092	−16 14 8.0	+44.88	16 15.13	8.92	−14 4.80	−0.235	20 57
6	Su	21 15 22.30	10.058	15 56 2.7	45.56	16 14.97	8.92	14 10.04	0.201	21 1
7	Mo	21 19 23.27	10.023	15 37 41.0	46.23	16 14.81	8.92	14 14.46	0.167	21 5
8	Tu	21 23 23.42	9.989	15 19 3.4	46.89	16 14.65	8.92	14 18.05	0.133	21 9
9	We	21 27 22.75	9.955	15 0 10.3	47.52	16 14.48	8.92	14 20.83	0.099	21 13
10	Th	21 31 21.28	9.922	−14 41 2.2	+48.14	16 14.31	8.92	−14 22.80	−0.065	21 16
11	Fr	21 35 19.00	9.889	14 21 39.5	48.74	16 14.14	8.92	14 23.96	−0.032	21 20
12	Sa	21 39 15.92	9.856	14 2 2.6	49.33	16 13.96	8.91	14 24.33	+0.001	21 24
13	Su	21 43 12.06	9.823	13 42 11.8	49.89	16 13.78	8.91	14 23.92	0.033	21 28
14	Mo	21 47 7.43	9.791	13 22 7.7	50.44	16 13.59	8.91	14 22.73	0.065	21 32
15	Tu	21 51 2.04	9.760	−13 1 50.6	+50.98	16 13.40	8.91	−14 20.78	+0.097	21 36
16	We	21 54 55.89	9.729	−12 41 20.9	+51.49	16 13.21	8.91	−14 18.08	+0.128	21 40

FOR GREENWICH MEAN NOON.

ate.	Day of the Year.	True Longitude.	Var. per Hour.	Latitude.	Logarithm of the Radius Vector of the Earth.	Var. per Hour.	Prec. in Long.	Nut. in Long.	Aberration.	True Obliquity.	Mean Time of Sidereal Noon.
		° ′ ″	″	″			″	″	″	23° 27′ ″	h m s
1	1	279 45 35.0	152.94	−0.58	9.992 6812	− 0.8	−0.03	+13.49	20.81	6.14	5 19 51.27
2	2	280 46 45.8	152.95	0.53	9.992 6802	− 0.1	+0.11	13.54	20.81	6.14	5 15 55.36
3	3	281 47 56.7	152.96	0.44	9.992 6810	+ 0.6	0.25	13.60	20.81	6.14	5 11 59.44
4	4	282 49 7.8	152.96	0.33	9.992 6834	1.3	0.39	13.65	20.81	6.14	5 8 3.53
5	5	283 50 18.9	152.96	0.21	9.992 6873	2.0	0.52	13.70	20.81	6.14	5 4 7.62
6	6	284 51 29.9	152.95	−0.07	9.992 6928	+ 2.6	0.66	+13.75	20.81	6.14	5 0 11.71
7	7	285 52 40.7	152.94	+0.08	9.992 6999	3.3	0.80	13.80	20.81	6.14	4 56 15.79
8	8	286 53 51.2	152.93	0.22	9.992 7087	4.0	0.94	13.85	20.81	6.15	4 52 19.88
9	9	287 55 1.2	152.91	0.34	9.992 7193	4.8	1.07	13.90	20.81	6.15	4 48 23.97
10	10	288 56 10.7	152.89	0.45	9.992 7318	5.6	1.21	13.95	20.81	6.16	4 44 28.06
11	11	289 57 19.7	152.86	+0.53	9.992 7463	+ 6.5	1.35	+14.00	20.81	6.16	4 40 32.14
12	12	290 58 28.1	152.83	0.59	9.992 7630	7.4	1.49	14.05	20.81	6.17	4 36 36.23
13	13	291 59 35.8	152.81	0.61	9.992 7820	8.4	1.63	14.09	20.81	6.17	4 32 40.32
14	14	293 0 42.9	152.78	0.61	9.992 8033	9.4	1.76	14.14	20.81	6.18	4 28 44.40
15	15	294 1 49.4	152.75	0.58	9.992 8271	10.4	1.90	14.18	20.81	6.19	4 24 48.49
16	16	295 2 55.1	152.73	+0.52	9.992 8535	+11.5	2.04	+14.22	20.80	6.19	4 20 52.58
17	17	296 4 0.2	152.70	0.44	9.992 8824	12.6	2.18	14.26	20.80	6.20	4 16 56.67
18	18	297 5 4.6	152.67	0.34	9.992 9140	13.7	2.31	14.30	20.80	6.21	4 13 0.76
19	19	298 6 8.4	152.64	0.22	9.992 9482	14.8	2.45	14.34	20.80	6.22	4 9 4.85
20	20	299 7 11.5	152.62	+0.09	9.992 9852	16.0	2.59	14.37	20.80	6.23	4 5 8.93
21	21	300 8 14.0	152.59	−0.04	9.993 0249	+17.1	2.72	+14.41	20.79	6.24	4 1 13.02
22	22	301 9 15.8	152.56	0.17	9.993 0672	18.2	2.86	14.44	20.79	6.25	3 57 17.11
23	23	302 10 17.0	152.54	0.29	9.993 1122	19.3	3.00	14.48	20.79	6.26	3 53 21.20
24	24	303 11 17.7	152.52	0.40	9.993 1598	20.3	3.14	14.51	20.79	6.27	3 49 25.29
25	25	304 12 17.7	152.49	0.48	9.993 2099	21.3	3.28	14.54	20.79	6.28	3 45 29.38
26	26	305 13 17.2	152.47	−0.54	9.993 2624	+22.3	3.41	+14.57	20.78	6.29	3 41 33.47
27	27	306 14 16.2	152.44	0.57	9.993 3171	23.2	3.55	14.60	20.78	6.30	3 37 37.56
28	28	307 15 14.5	152.42	0.56	9.993 3739	24.1	3.69	14.62	20.78	6.31	3 33 41.64
29	29	308 16 12.2	152.39	0.52	9.993 4327	24.9	3.83	14.65	20.78	6.32	3 29 45.73
30	30	309 17 9.3	152.36	0.45	9.993 4933	25.6	3.96	14.67	20.77	6.33	3 25 49.82
31	31	310 18 5.6	152.33	−0.35	9.993 5555	+26.2	4.10	+14.69	20.77	6.34	3 21 53.91
b. 1	32	311 19 1.2	152.30	0.23	9.993 6191	26.8	4.24	14.71	20.77	6.35	3 17 58.00
2	33	312 19 55.8	152.26	−0.10	9.993 6841	27.4	4.38	14.72	20.76	6.36	3 14 2.09
3	34	313 20 49.5	152.21	+0.04	9.993 7504	27.9	4.51	14.74	20.76	6.37	3 10 6.18
4	35	314 21 42.0	152.16	0.19	9.993 8179	28.4	4.65	14.75	20.76	6.39	3 6 10.27
5	36	315 22 33.4	152.11	+0.32	9.993 8866	+28.9	4.79	+14.76	20.75	6.40	3 2 14.36
6	37	316 23 23.4	152.05	0.43	9.993 9566	29.4	4.93	14.77	20.75	6.41	2 58 18.45
7	38	317 24 12.0	151.99	0.52	9.994 0279	30.0	5.07	14.78	20.75	6.43	2 54 22.54
8	39	318 24 59.1	151.93	0.58	9.994 1006	30.6	5.20	14.79	20.74	6.44	2 50 26.63
9	40	319 25 44.8	151.87	0.62	9.994 1748	31.3	5.34	14.80	20.74	6.45	2 46 30.72
10	41	320 26 28.8	151.80	+0.63	9.994 2506	+32.0	5.48	+14.80	20.74	6.46	2 42 34.81
11	42	321 27 11.2	151.73	0.61	9.994 3282	32.7	5.62	14.80	20.73	6.47	2 38 38.90
12	43	322 27 52.0	151.67	0.56	9.994 4075	33.4	5.75	14.80	20.73	6.48	2 34 42.99
13	44	323 28 31.1	151.60	0.48	9.994 4886	34.2	5.89	14.80	20.73	6.49	2 30 47.08
14	45	324 29 8.6	151.53	0.39	9.994 5717	35.0	6.03	14.80	20.72	6.50	2 26 51.17
15	46	325 29 44.5	151.46	+0.28	9.994 6567	+35.8	6.16	+14.79	20.72	6.51	2 22 55.26
16	47	326 30 18.7	151.39	+0.15	9.994 7436	+36.7	6.30	+14.78	20.71	6.52	2 18 59.35

FOR GREENWICH MEAN NOON.

Date.	Day of the Week.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Semi-diameter.	Hor. Par.	Equation of Time. App.—Mean.	Var. per Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	′ ″	″	m s	s	h m s
Feb. 16	We	21 54 55.89	9.729	−12 41 20.9	+51.49	16 13.21	8.91	−14 18.08	+0.128	21 40 37.81
17	Th	21 58 49.01	9.698	12 20 39.0	51.99	16 13.01	8.91	14 14.65	0.158	21 44 34.37
18	Fr	22 2 41.42	9.669	11 59 45.3	52.47	16 12.80	8.90	14 10.49	0.188	21 48 30.92
19	Sa	22 6 33.12	9.640	11 38 40.2	52.94	16 12.59	8.90	14 5.64	0.217	21 52 27.48
20	Su	22 10 24.13	9.612	11 17 24.1	53.39	16 12.38	8.90	14 0.10	0.245	21 56 24.03
21	Mo	22 14 14.47	9.584	−10 55 57.4	+53.83	16 12.16	8.90	−13 53.88	+0.272	22 0 20.59
22	Tu	22 18 4.16	9.557	10 34 20.4	54.25	16 11.93	8.89	13 47.02	0.299	22 4 17.14
23	We	22 21 53.22	9.531	10 12 33.6	54.65	16 11.71	8.89	13 39.53	0.325	22 8 13.70
24	Th	22 25 41.67	9.506	9 50 37.3	55.04	16 11.48	8.89	13 31.42	0.350	22 12 10.25
25	Fr	22 29 29.52	9.482	9 28 32.0	55.41	16 11.25	8.89	13 22.72	0.374	22 16 6.81
26	Sa	22 33 16.79	9.458	− 9 6 17.9	+55.76	16 11.01	8.89	−13 13.43	+0.398	22 20 3.36
27	Su	22 37 3.50	9.435	8 43 55.5	56.10	16 10.78	8.88	13 3.59	0.421	22 23 59.91
28	Mo	22 40 49.67	9.413	8 21 25.3	56.42	16 10.54	8.88	12 53.20	0.444	22 27 56.47
29	Tu	22 44 35.31	9.391	7 58 47.6	56.72	16 10.30	8.88	12 42.29	0.466	22 31 53.02
Mar. 1	We	22 48 20.43	9.370	7 36 2.8	57.00	16 10.05	8.88	12 30.86	0.487	22 35 49.57
2	Th	22 52 5.06	9.349	− 7 13 11.4	+57.27	16 9.81	8.88	−12 18.93	+0.507	22 39 46.13
3	Fr	22 55 49.20	9.329	6 50 13.8	57.52	16 9.56	8.87	12 6.52	0.527	22 43 42.68
4	Sa	22 59 32.87	9.310	6 27 10.5	57.75	16 9.31	8.87	11 53.64	0.546	22 47 39.24
5	Su	23 3 16.09	9.292	6 4 1.8	57.96	16 9.06	8.87	11 40.30	0.565	22 51 35.79
6	Mo	23 6 58.87	9.274	5 40 48.2	58.16	16 8.81	8.87	11 26.52	0.583	22 55 32.34
7	Tu	23 10 41.22	9.256	− 5 17 30.1	+58.34	16 8.56	8.86	−11 12.32	+0.600	22 59 28.90
8	We	23 14 23.16	9.240	4 54 7.9	58.50	16 8.31	8.86	10 57.72	0.616	23 3 25.45
9	Th	23 18 4.72	9.224	4 30 42.0	58.64	16 8.06	8.86	10 42.72	0.632	23 7 22.00
10	Fr	23 21 45.91	9.209	4 7 12.7	58.77	16 7.81	8.85	10 27.35	0.647	23 11 18.56
11	Sa	23 25 26.74	9.195	3 43 40.5	58.89	16 7.55	8.85	10 11.63	0.662	23 15 15.11
12	Su	23 29 7.24	9.181	− 3 20 5.8	+58.99	16 7.29	8.85	− 9 55.58	+0.675	23 19 11.67
13	Mo	23 32 47.43	9.168	2 56 28.9	59.08	16 7.03	8.85	9 39.21	0.688	23 23 8.22
14	Tu	23 36 27.33	9.157	2 32 50.1	59.15	16 6.77	8.85	9 22.56	0.700	23 27 4.77
15	We	23 40 6.96	9.146	2 9 9.9	59.20	16 6.51	8.85	9 5.63	0.710	23 31 1.33
16	Th	23 43 46.34	9.136	1 45 28.6	59.24	16 6.25	8.84	8 48.46	0.720	23 34 57.88
17	Fr	23 47 25.49	9.127	− 1 21 46.5	+59.26	16 5.98	8.84	− 8 31.06	+0.729	23 38 54.43
18	Sa	23 51 4.44	9.119	0 58 4.0	59.27	16 5.71	8.84	8 13.46	0.737	23 42 50.99
19	Su	23 54 43.21	9.112	0 34 21.5	59.27	16 5.44	8.84	7 55.68	0.744	23 46 47.54
20	Mo	23 58 21.83	9.106	− 0 10 39.3	59.25	16 5.17	8.83	7 37.74	0.750	23 50 44.09
21	Tu	0 2 0.32	9.101	+ 0 13 2.4	59.22	16 4.89	8.83	7 19.68	0.755	23 54 40.65
22	We	0 5 38.70	9.097	+ 0 36 43.2	+59.17	16 4.61	8.83	− 7 1.50	+0.759	23 58 37.20
23	Th	0 9 17.00	9.095	1 0 22.7	59.11	16 4.33	8.83	6 43.25	0.762	0 2 33.75
24	Fr	0 12 55.24	9.093	1 24 0.6	59.04	16 4.05	8.83	6 24.94	0.764	0 6 30.30
25	Sa	0 16 33.45	9.092	1 47 36.5	58.95	16 3.77	8.82	6 6.59	0.765	0 10 26.86
26	Su	0 20 11.64	9.092	2 11 10.1	58.85	16 3.49	8.82	5 48.23	0.765	0 14 23.41
27	Mo	0 23 49.84	9.093	+ 2 34 41.1	+58.73	16 3.20	8.82	− 5 29.88	+0.764	0 18 19.96
28	Tu	0 27 28.07	9.094	2 58 9.1	58.60	16 2.91	8.82	5 11.55	0.763	0 22 16.52
29	We	0 31 6.34	9.096	3 21 33.7	58.45	16 2.63	8.81	4 53.27	0.760	0 26 13.07
30	Th	0 34 44.68	9.099	3 44 54.6	58.28	16 2.35	8.81	4 35.06	0.757	0 30 9.63
31	Fr	0 38 23.10	9.103	4 8 11.3	58.10	16 2.07	8.81	4 16.92	0.753	0 34 6.18
Apr. 1	Sa	0 42 1.62	9.107	+ 4 31 23.5	+57.91	16 1.79	8.80	− 3 58.88	+0.749	0 38 2.73
2	Su	0 45 40.25	9.112	+ 4 54 30.8	+57.69	16 1.52	8.80	− 3 40.96	+0.744	0 41 59.29

FOR GREENWICH MEAN NOON.

Date.	Day of the Year.	True Longitude.	Var. per Hour.	Latitude.	Logarithm of the Radius Vector of the Earth.	Var. per Hour.	Prec. in Long.	Nut. in Long.	Aberration.	True Obliquity.	Mean Time of Sidereal Noon.
		° ′ ″	″	″			″	″	″	23° 27′ ″	h m s
Feb. 16	47	326 30 18.7	151.39	+0.15	9.994 7436	+36.7	6.30	+14.78	20.71	6.52	2 18 59.35
17	48	327 30 51.3	151.32	+0.02	9.994 8327	37.5	6.44	14.78	20.71	6.53	2 15 3.44
18	49	328 31 22.3	151.26	−0.11	9.994 9238	38.4	6.58	14.77	20.70	6.54	2 11 7.54
19	50	329 31 51.7	151.19	0.23	9.995 0169	39.3	6.72	14.76	20.70	6.55	2 7 11.63
20	51	330 32 19.5	151.13	0.34	9.995 1122	40.1	6.85	14.75	20.69	6.56	2 3 15.72
21	52	331 32 45.8	151.07	−0.44	9.995 2094	+40.9	6.99	+14.74	20.69	6.57	1 59 19.81
22	53	332 33 10.7	151.01	0.51	9.995 3086	41.7	7.13	14.73	20.68	6.58	1 55 23.90
23	54	333 33 34.1	150.95	0.55	9.995 4097	42.4	7.27	14.71	20.68	6.59	1 51 27.99
24	55	334 33 56.1	150.89	0.55	9.995 5124	43.1	7.40	14.70	20.67	6.60	1 47 32.08
25	56	335 34 16.7	150.83	0.52	9.995 6168	43.7	7.54	14.68	20.67	6.60	1 43 36.18
26	57	336 34 35.9	150.77	−0.46	9.995 7226	+44.3	7.68	+14.66	20.66	6.61	1 39 40.27
27	58	337 34 53.7	150.71	0.37	9.995 8295	44.8	7.82	14.64	20.66	6.62	1 35 44.36
28	59	338 35 10.1	150.65	0.25	9.995 9376	45.2	7.95	14.62	20.66	6.62	1 31 48.45
29	60	339 35 24.9	150.59	−0.12	9.996 0464	45.5	8.09	14.60	20.65	6.63	1 27 52.54
ar. 1	61	340 35 38.3	150.52	+0.02	9.996 1561	45.8	8.23	14.57	20.65	6.63	1 23 56.64
2	62	341 35 50.0	150.45	+0.16	9.996 2662	+46.0	8.37	+14.55	20.64	6.63	1 20 0.73
3	63	342 36 0.0	150.38	0.29	9.996 3769	46.2	8.51	14.52	20.64	6.63	1 16 4.82
4	64	343 36 8.3	150.30	0.41	9.996 4880	46.4	8.64	14.50	20.63	6.63	1 12 8.91
5	65	344 36 14.6	150.22	0.51	9.996 5994	46.5	8.78	14.47	20.63	6.63	1 8 13.00
6	66	345 36 19.1	150.14	0.58	9.996 7112	46.6	8.92	14.44	20.62	6.64	1 4 17.10
7	67	346 36 21.4	150.05	+0.62	9.996 8234	+46.8	9.06	+14.41	20.62	6.64	1 0 21.19
8	68	347 36 21.7	149.97	0.63	9.996 9360	47.0	9.19	14.38	20.61	6.64	0 56 25.28
9	69	348 36 19.9	149.88	0.62	9.997 0492	47.3	9.33	14.35	20.60	6.64	0 52 29.37
10	70	349 36 15.9	149.79	0.58	9.997 1630	47.6	9.47	14.32	20.60	6.64	0 48 33.46
11	71	350 36 9.7	149.69	0.52	9.997 2775	47.9	9.60	14.29	20.59	6.64	0 44 37.56
12	72	351 36 1.3	149.60	+0.44	9.997 3927	+48.2	9.74	+14.26	20.58	6.63	0 40 41.65
13	73	352 35 50.6	149.51	0.33	9.997 5087	48.5	9.88	14.23	20.58	6.63	0 36 45.74
14	74	353 35 37.8	149.42	0.21	9.997 6255	48.9	10.02	14.20	20.57	6.62	0 32 49.84
15	75	354 35 22.8	149.33	+0.08	9.997 7433	49.3	10.16	14.16	20.57	6.62	0 28 53.93
16	76	355 35 5.5	149.24	−0.05	9.997 8620	49.7	10.29	14.13	20.56	6.62	0 24 58.02
17	77	356 34 46.1	149.15	−0.17	9.997 9818	+50.1	10.43	+14.10	20.55	6.61	0 21 2.11
18	78	357 34 24.6	149.06	0.28	9.998 1026	50.6	10.57	14.06	20.55	6.61	0 17 6.20
19	79	358 34 1.0	148.97	0.37	9.998 2244	51.0	10.71	14.03	20.54	6.60	0 13 10.30
20	80	359 33 35.3	148.89	0.44	9.998 3474	51.4	10.84	14.00	20.54	6.60	0 9 14.39
21	81	0 33 7.7	148.81	0.48	9.998 4714	51.8	10.98	13.96	20.53	6.59	0 5 18.48
22	82	1 32 38.2	148.73	−0.49	9.998 5963	+52.2	11.12	+13.93	20.52	6.58	0 1 22.57 23 57 26.67
23	83	2 32 6.8	148.65	0.47	9.998 7222	52.6	11.26	13.89	20.52	6.57	23 53 30.76
24	84	3 31 33.6	148.58	0.42	9.998 8488	52.9	11.39	13.86	20.51	6.56	23 49 34.85
25	85	4 30 58.6	148.51	0.35	9.998 9759	53.1	11.53	13.83	20.51	6.55	23 45 38.94
26	86	5 30 22.0	148.44	0.24	9.999 1034	53.2	11.67	13.79	20.50	6.53	23 41 43.04
27	87	6 29 43.5	148.36	−0.11	9.999 2312	+53.2	11.81	+13.76	20.50	6.52	23 37 47.13
28	88	7 29 3.3	148.29	+0.03	9.999 3590	53.2	11.95	13.73	20.49	6.51	23 33 51.22
29	89	8 28 21.4	148.22	0.16	9.999 4867	53.1	12.08	13.69	20.49	6.50	23 29 55.31
30	90	9 27 37.7	148.14	0.29	9.999 6140	53.0	12.22	13.66	20.48	6.49	23 25 59.41
31	91	10 26 52.2	148.06	0.41	9.999 7410	52.8	12.35	13.63	20.48	6.47	23 22 3.50
r. 1	92	11 26 4.7	147.98	+0.51	9.999 8674	+52.5	12.49	+13.60	20.47	6.46	23 18 7.59
2	93	12 25 15.2	147.90	+0.58	9.999 9931	+52.3	12.63	+13.57	20.47	6.44	23 14 11.68

FOR GREENWICH MEAN NOON.

Date.	Day of the Week.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Semi-diameter.	Hor. Par.	Equation of Time. App.—Mean.	Var. per Hour.	Sidere or Righ sion o Su
		h m s	s	° ′ ″	″	′ ″	″	m s	s	h m
Apr. 1	Sa	0 42 1.62	9.107	+ 4 31 23.5	+57.91	16 1.79	8.80	−3 58.88	+0.749	0 38
2	Su	0 45 40.25	9.112	4 54 30.8	57.69	16 1.52	8.80	3 40.96	0.744	0 41
3	Mo	0 49 19.00	9.118	5 17 32.8	57.46	16 1.24	8.80	3 23.16	0.738	0 45
4	Tu	0 52 57.90	9.124	5 40 29.2	57.22	16 0.97	8.79	3 5.50	0.732	0 49
5	We	0 56 36.96	9.131	6 3 19.6	56.97	16 0.69	8.79	2 48.01	0.725	0 53
6	Th	1 0 16.19	9.138	+ 6 26 3.7	+56.70	16 0.42	8.79	−2 30.68	+0.718	0 57
7	Fr	1 3 55.60	9.147	6 48 41.0	56.41	16 0.15	8.79	2 13.55	0.710	1 1
8	Sa	1 7 35.22	9.156	7 11 11.2	56.11	15 59.88	8.78	1 56.62	0.701	1 5
9	Su	1 11 15.07	9.165	7 33 34.0	55.79	15 59.61	8.78	1 39.91	0.691	1 9
10	Mo	1 14 55.16	9.175	7 55 49.1	55.46	15 59.34	8.78	1 23.44	0.681	1 13
11	Tu	1 18 35.49	9.186	+ 8 17 56.1	+55.12	15 59.07	8.78	−1 7.22	+0.670	1 17
12	We	1 22 16.10	9.108	8 39 54.6	54.76	15 58.81	8.77	0 51.28	0.658	1 21
13	Th	1 25 57.00	9.211	9 1 44.4	54.39	15 58.54	8.77	0 35.62	0.646	1 25
14	Fr	1 29 38.20	9.224	9 23 25.2	54.00	15 58.27	8.77	0 20.27	0.633	1 29
15	Sa	1 33 19.72	9.238	9 44 56.5	53.60	15 58.01	8.77	−0 5.24	0.619	1 33
16	Su	1 37 1.59	9.252	+10 6 18.1	+53.19	15 57.75	8.76	+0 9.45	+0.604	1 37
17	Mo	1 40 43.81	9.267	10 27 29.7	52.77	15 57.48	8.76	0 23.78	0.589	1 41
18	Tu	1 44 26.41	9.283	10 48 31.0	52.33	15 57.22	8.76	0 37.74	0.573	1 45
19	We	1 48 9.41	9.300	11 9 21.7	51.88	15 56.95	8.75	0 51.29	0.556	1 49
20	Th	1 51 62.82	9.318	11 30 1.4	51.42	15 56.69	8.75	1 4.44	0.538	1 52
21	Fr	1 55 36.66	9.337	+11 50 29.9	+50.95	15 56.42	8.75	+1 17.15	+0.520	1 56
22	Sa	1 59 20.96	9.356	12 10 46.8	50.46	15 56.16	8.75	1 29.41	0.501	2 0
23	Su	2 3 5.72	9.375	12 30 51.8	49.96	15 55.90	8.75	1 41.20	0.481	2 4
24	Mo	2 6 50.95	9.395	12 50 44.7	49.44	15 55.64	8.75	1 52.52	0.461	2 8
25	Tu	2 10 36.68	9.416	13 10 25.0	48.91	15 55.38	8.74	2 3.35	0.440	2 12
26	We	2 14 22.91	9.437	+13 29 52.4	+48.37	15 55.12	8.74	+2 13.67	+0.419	2 16
27	Th	2 18 9.66	9.458	13 49 6.6	47.81	15 54.87	8.74	2 23.48	0.398	2 20
28	Fr	2 21 56.93	9.480	14 8 7.2	47.24	15 54.62	8.74	2 32.77	0.376	2 24
29	Sa	2 25 44.72	9.502	14 26 53.9	46.65	15 54.37	8.74	2 41.53	0.354	2 28
30	Su	2 29 33.05	9.525	14 45 26.3	46.05	15 54.12	8.73	2 49.76	0.332	2 32
May 1	Mo	2 33 21.91	9.547	+15 3 44.2	+45.43	15 53.88	8.73	+2 57.45	+0.309	2 36
2	Tu	2 37 11.31	9.570	15 21 47.1	44.80	15 53.65	8.73	3 4.61	0.287	2 40
3	We	2 41 1.26	9.592	15 39 34.7	44.16	15 53.41	8.73	3 11.22	0.264	2 44
4	Th	2 44 51.75	9.615	15 57 6.7	43.50	15 53.18	8.72	3 17.28	0.241	2 48
5	Fr	2 48 42.79	9.638	16 14 22.9	42.83	15 52.95	8.72	3 22.79	0.218	2 52
6	Sa	2 52 34.38	9.661	+16 31 22.9	+42.15	15 52.73	8.72	+3 27.76	+0.195	2 56
7	Su	2 56 26.53	9.684	16 48 6.3	41.46	15 52.51	8.72	3 32.17	0.172	2 59
8	Mo	3 0 19.23	9.707	17 4 32.8	40.75	15 52.30	8.72	3 36.03	0.149	3 3
9	Tu	3 4 12.48	9.730	17 20 42.2	40.03	15 52.09	8.71	3 39.33	0.126	3 7
10	We	3 8 6.29	9.754	17 36 34.2	39.30	15 51.88	8.71	3 42.08	0.103	3 11
11	Th	3 12 0.65	9.777	+17 52 8.4	+38.55	15 51.67	8.71	+3 44.27	+0.080	3 15
12	Fr	3 15 55.57	9.800	18 7 24.6	37.80	15 51.47	8.71	3 45.91	0.057	3 19
13	Sa	3 19 51.05	9.823	18 22 22.6	37.03	15 51.26	8.71	3 46.99	0.033	3 23
14	Su	3 23 47.08	9.846	18 37 2.0	36.25	15 51.06	8.70	3 47.51	+0.010	3 27
15	Mo	3 27 43.67	9.869	18 51 22.6	35.46	15 50.86	8.70	3 47.48	-0.013	3 31
16	Tu	3 31 40.81	9.893	+19 5 24.1	+34.66	15 50.66	8.70	+3 46.89	−0.036	3 35
17	We	3 35 38.51	9.916	+19 19 6.2	+33.85	15 50.47	8.70	+3 45.74	−0.059	3 39

FOR GREENWICH MEAN NOON.

Date.	Day of the Year.	True Longitude.	Var. per Hour.	Latitude.	Logarithm of the Radius Vector of the Earth.	Var. per Hour.	Prec. in Long.	Nut. in Long.	Aberration.	True Obliquity.	Mean Time of Sidereal Noon.
		° ′ ″	″	″			″	″	″	23° 27′ ″	h m s
Apr. 1	92	11 26 4.7	147.98	+0.51	9.999 8674	+52.5	12.49	+13.60	20.47	6.46	23 18 7.59
2	93	12 25 15.2	147.90	0.58	9.999 9931	52.3	12.63	13.57	20.47	6.44	23 14 11.68
3	94	13 24 23.8	147.81	0.62	0.000 1182	52.0	12.77	13.54	20.46	6.42	23 10 15.78
4	95	14 23 30.2	147.72	0.64	0.000 2426	51.7	12.91	13.51	20.46	6.40	23 6 19.87
5	96	15 22 34.4	147.63	0.63	0.000 3663	51.4	13.04	13.49	20.45	6.38	23 2 23.96
6	97	16 21 36.5	147.54	+0.59	0.000 4894	+51.1	13.18	+13.46	20.45	6.37	22 58 28.05
7	98	17 20 36.4	147.45	0.53	0.000 6119	50.9	13.32	13.43	20.44	6.35	22 54 32.14
8	99	18 19 34.0	147.35	0.45	0.000 7338	50.7	13.46	13.40	20.43	6.33	22 50 36.24
9	100	19 18 29.4	147.26	0.35	0.000 8553	50.5	13.60	13.38	20.43	6.31	22 46 40.33
10	101	20 17 22.4	147.16	0.24	0.000 9763	50.3	13.73	13.36	20.42	6.29	22 42 44.42
11	102	21 16 13.3	147.07	+0.12	0.001 0970	+50.2	13.87	+13.33	20.41	6.27	22 38 48.51
12	103	22 15 1.8	146.98	−0.01	0.001 2173	50.1	14.01	13.31	20.41	6.25	22 34 52.60
13	104	23 13 48.1	146.88	0.13	0.001 3374	50.0	14.15	13.29	20.40	6.22	22 30 56.70
14	105	24 12 32.2	146.79	0.24	0.001 4574	50.0	14.28	13.27	20.40	6.20	22 27 0.79
15	106	25 11 14.1	146.70	0.33	0.001 5772	49.9	14.42	13.25	20.39	6.18	22 23 4.88
16	107	26 9 53.8	146.61	−0.40	0.001 6970	+49.9	14.56	+13.23	20.38	6.16	22 19 8.97
17	108	27 8 31.5	146.53	0.44	0.001 8169	49.9	14.70	13.21	20.38	6.14	22 15 13.06
18	109	28 7 7.2	146.45	0.45	0.001 9368	49.9	14.83	13.20	20.37	6.12	22 11 17.16
19	110	29 5 41.0	146.37	0.43	0.002 0566	49.9	14.97	13.18	20.37	6.10	22 7 21.25
20	111	30 4 13.0	146.30	0.39	0.002 1765	49.9	15.11	13.17	20.36	6.07	22 3 25.34
21	112	31 2 43.2	146.23	−0.32	0.002 2962	+49.8	15.25	+13.16	20.35	6.05	21 59 29.43
22	113	32 1 11.7	146.16	0.22	0.002 4157	49.7	15.39	13.15	20.35	6.03	21 55 33.52
23	114	32 59 38.6	146.09	−0.09	0.002 5347	49.5	15.52	13.14	20.34	6.00	21 51 37.61
24	115	33 58 4.0	146.02	+0.05	0.002 6531	49.2	15.66	13.13	20.34	5.98	21 47 41.70
25	116	34 56 27.8	145.96	0.18	0.002 7708	48.8	15.79	13.12	20.33	5.95	21 43 45.79
26	117	35 54 50.0	145.89	+0.30	0.002 8875	+48.4	15.93	+13.11	20.33	5.92	21 39 49.88
27	118	36 53 10.7	145.83	0.42	0.003 0031	47.9	16.07	13.11	20.32	5.90	21 35 53.98
28	119	37 51 29.9	145.77	0.53	0.003 1175	47.4	16.21	13.10	20.32	5.87	21 31 58.07
29	120	38 49 47.5	145.70	0.61	0.003 2304	46.8	16.35	13.10	20.31	5.85	21 28 2.16
30	121	39 48 3.4	145.63	0.66	0.003 3419	46.1	16.48	13.10	20.31	5.82	21 24 6.25
May 1	122	40 46 17.7	145.56	+0.68	0.003 4518	+45.4	16.62	+13.10	20.30	5.79	21 20 10.34
2	123	41 44 30.3	145.49	0.67	0.003 5600	44.7	16.76	13.10	20.30	5.77	21 16 14.43
3	124	42 42 41.2	145.41	0.63	0.003 6667	44.0	16.90	13.11	20.30	5.74	21 12 18.52
4	125	43 40 50.2	145.34	0.56	0.003 7716	43.3	17.04	13.11	20.29	5.71	21 8 22.61
5	126	44 38 57.5	145.26	0.48	0.003 8750	42.6	17.17	13.12	20.28	5.68	21 4 26.70
6	127	45 37 2.9	145.19	+0.38	0.003 9768	+42.0	17.31	+13.13	20.28	5.66	21 0 30.79
7	128	46 35 6.5	145.11	0.27	0.004 0770	41.4	17.45	13.14	20.28	5.63	20 56 34.88
8	129	47 33 8.2	145.03	0.15	0.004 1757	40.8	17.59	13.15	20.27	5.61	20 52 38.97
9	130	48 31 8.1	144.96	+0.02	0.004 2730	40.2	17.72	13.16	20.26	5.58	20 48 43.06
10	131	49 29 6.1	144.88	−0.10	0.004 3689	39.7	17.86	13.17	20.26	5.55	20 44 47.15
11	132	50 27 2.3	144.80	−0.21	0.004 4635	+39.2	18.00	+13.18	20.26	5.53	20 40 51.24
12	133	51 24 56.6	144.73	0.31	0.004 5569	38.7	18.14	13.20	20.25	5.50	20 36 55.33
13	134	52 22 49.2	144.66	0.38	0.004 6491	38.2	18.27	13.22	20.25	5.48	20 32 59.42
14	135	53 20 40.1	144.59	0.42	0.004 7404	37.8	18.41	13.24	20.24	5.45	20 29 3.51
15	136	54 18 29.3	144.52	0.43	0.004 8307	37.5	18.55	13.26	20.24	5.42	20 25 7.60
16	137	55 16 16.8	144.45	−0.41	0.004 9201	+37.2	18.69	+13.28	20.23	5.40	20 21 11.68
17	138	56 14 2.9	144.39	−0.37	0.005 0088	+36.9	18.83	+13.30	20.23	5.38	20 17 15.77

SUN, 1916.

FOR GREENWICH MEAN NOON.

Date.	Day of the Week.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Semi-diameter.	Hor. Par.	Equation of Time. App.—Mean.	Var. per Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	′ ″	″	m s	s	h m s
May 17	We	3 35 38.51	9.916	+19 19 6.2	+33.85	15 50.47	8.70	+3 45.74	−0.059	3 39 24.26
18	Th	3 39 36.78	9.939	19 32 28.8	33.03	15 50.28	8.70	3 44.04	0.083	3 43 20.82
19	Fr	3 43 35.61	9.963	19 45 31.5	32.19	15 50.09	8.69	3 41.77	0.106	3 47 17.38
20	Sa	3 47 34.99	9.986	19 58 14.1	31.35	15 49.91	8.69	3 38.94	0.129	3 51 13.93
21	Su	3 51 34.93	10.009	20 10 36.4	30.50	15 49.72	8.69	3 35.56	0.153	3 55 10.49
22	Mo	3 55 35.43	10.032	+20 22 38.1	+29.64	15 49.54	8.69	+3 31.62	−0.176	3 59 7.05
23	Tu	3 59 36.47	10.055	20 34 19.0	28.76	15 49.36	8.69	3 27.13	0.198	4 3 3.60
24	We	4 3 38.05	10.077	20 45 38.7	27.88	15 49.18	8.69	3 22.11	0.220	4 7 0.16
25	Th	4 7 40.17	10.099	20 56 37.1	26.98	15 49.00	8.69	3 16.55	0.242	4 10 56.72
26	Fr	4 11 42.80	10.121	21 7 13.9	26.08	15 48.83	8.68	3 10.48	0.263	4 14 53.28
27	Sa	4 15 45.93	10.141	+21 17 28.9	+25.16	15 48.67	8.68	+3 3.90	−0.284	4 18 49.83
28	Su	4 19 49.56	10.161	21 27 21.8	24.24	15 48.51	8.68	2 56.83	0.304	4 22 46.39
29	Mo	4 23 53.66	10.180	21 36 52.5	23.31	15 48.35	8.68	2 49.29	0.323	4 26 42.95
30	Tu	4 27 58.21	10.199	21 46 0.7	22.37	15 48.20	8.68	2 41.29	0.342	4 30 39.50
31	We	4 32 3.21	10.217	21 54 46.2	21.42	15 48.06	8.68	2 32.85	0.360	4 34 36.06
June 1	Th	4 36 8.62	10.234	+22 3 8.8	+20.46	15 47.92	8.68	+2 24.00	−0.377	4 38 32.62
2	Fr	4 40 14.43	10.250	22 11 8.3	19.50	15 47.78	8.67	2 14.74	0.393	4 42 29.18
3	Sa	4 44 20.62	10.265	22 18 44.6	18.53	15 47.65	8.67	2 5.11	0.408	4 46 25.74
4	Su	4 48 27.17	10.280	22 25 57.5	17.55	15 47.53	8.67	1 55.12	0.423	4 50 22.29
5	Mo	4 52 34.06	10.294	22 32 46.9	16.56	15 47.41	8.67	1 44.79	0.437	4 54 18.85
6	Tu	4 56 41.27	10.306	+22 39 12.5	+15.57	15 47.29	8.67	+1 34.14	−0.450	4 58 15.41
7	We	5 0 48.77	10.318	22 45 14.3	14.58	15 47.18	8.67	1 23.20	0.462	5 2 11.97
8	Th	5 4 56.54	10.329	22 50 52.2	13.58	15 47.07	8.67	1 11.98	0.473	5 6 8.53
9	Fr	5 9 4.57	10.339	22 56 6.0	12.57	15 46.97	8.67	1 0.51	0.483	5 10 5.08
10	Sa	5 13 12.83	10.348	23 0 55.6	11.56	15 46.87	8.66	0 48.81	0.492	5 14 1.64
11	Su	5 17 21.30	10.356	+23 5 20.9	+10.55	15 46.77	8.66	+0 36.90	−0.500	5 17 58.20
12	Mo	5 21 29.95	10.364	23 9 21.9	9.53	15 46.68	8.66	0 24.81	0.507	5 21 54.76
13	Tu	5 25 38.78	10.371	23 12 58.5	8.51	15 46.59	8.66	0 12.54	0.514	5 25 51.32
14	We	5 29 47.76	10.377	23 16 10.5	7.49	15 46.50	8.66	+0 0.12	0.520	5 29 47.87
15	Th	5 33 56.87	10.382	23 18 58.0	6.47	15 46.42	8.66	−0 12.43	0.525	5 33 44.43
16	Fr	5 38 6.09	10.386	+23 21 20.9	+ 5.44	15 46.34	8.66	−0 25.10	−0.530	5 37 40.99
17	Sa	5 42 15.41	10.390	23 23 19.1	4.41	15 46.27	8.66	0 37.87	0.534	5 41 37.55
18	Su	5 46 24.82	10.393	23 24 52.6	3.38	15 46.20	8.66	0 50.72	0.537	5 45 34.11
19	Mo	5 50 34.30	10.395	23 26 1.3	2.35	15 46.13	8.66	1 3.64	0.539	5 49 30.66
20	Tu	5 54 43.82	10.396	23 26 45.2	1.31	15 46.06	8.66	1 16.59	0.540	5 53 27.22
21	We	5 58 53.35	10.397	+23 27 4.4	+ 0.28	15 46.00	8.66	−1 29.57	−0.541	5 57 23.78
22	Th	6 3 2.88	10.397	23 26 58.7	− 0.75	15 45.94	8.66	1 42.54	0.540	6 1 20.34
23	Fr	6 7 12.39	10.396	23 26 28.2	1.79	15 45.88	8.66	1 55.50	0.538	6 5 16.90
24	Sa	6 11 21.86	10.393	23 25 32.8	2.82	15 45.83	8.66	2 8.40	0.536	6 9 13.46
25	Su	6 15 31.25	10.389	23 24 12.7	3.85	15 45.78	8.66	2 21.23	0.532	6 13 10.02
26	Mo	6 19 40.53	10.384	+23 22 27.8	− 4.88	15 45.74	8.66	−2 33.96	−0.527	6 17 6.57
27	Tu	6 23 49.69	10.378	23 20 18.3	5.91	15 45.71	8.66	2 46.56	0.522	6 21 3.13
28	We	6 27 58.70	10.372	23 17 44.1	6.94	15 45.68	8.66	2 59.01	0.515	6 24 59.69
29	Th	6 32 7.53	10.364	23 14 45.3	7.96	15 45.66	8.66	3 11.28	0.507	6 28 56.25
30	Fr	6 36 16.15	10.354	23 11 22.1	8.98	15 45.64	8.66	3 23.35	0.498	6 32 52.81
July 1	Sa	6 40 24.54	10.344	+23 7 34.5	− 9.99	15 45.63	8.66	−3 35.18	−0.488	6 36 49.36
2	Su	6 44 32.68	10.333	+23 3 22.6	−11.00	15 45.62	8.66	−3 46.76	−0.477	6 40 45.92

FOR GREENWICH MEAN NOON.

Date.	Day of the Year.	True Longitude.	Var. per Hour.	Latitude.	Logarithm of the Radius Vector of the Earth.	Var. per Hour.	Prec. in Long.	Nut. in Long.	Aberration.	True Obliquity.	Mean Time of Sidereal Noon.
		° ′ ″	″	″			″	″	″	23° 27′ ″	h m s
May 17	138	56 14 2.9	144.39	−0.37	0.005 0088	+36.9	18.83	+13.30	20.23	5.38	20 17 15.77
18	139	57 11 47.5	144.33	0.30	0.005 0966	36.5	18.96	13.32	20.23	5.35	20 13 19.86
19	140	58 9 30.9	144.28	0.21	0.005 1836	36.1	19.10	13.35	20.22	5.32	20 9 23.95
20	141	59 7 13.0	144.23	−0.09	0.005 2697	35.7	19.23	13.38	20.22	5.30	20 5 28.04
21	142	60 4 54.0	144.18	+0.05	0.005 3547	35.2	19.37	13.41	20.22	5.28	20 1 32.13
22	143	61 2 34.0	144.14	+0.18	0.005 4386	+34.6	19.51	+13.44	20.21	5.25	19 57 36.22
23	144	62 0 13.0	144.10	0.31	0.005 5211	34.0	19.65	13.47	20.21	5.23	19 53 40.31
24	145	62 57 51.0	144.06	0.44	0.005 6021	33.4	19.79	13.50	20.20	5.20	19 49 44.40
25	146	63 55 28.1	144.03	0.55	0.005 6814	32.7	19.92	13.53	20.20	5.18	19 45 48.48
26	147	64 53 4.2	143.99	0.63	0.005 7589	31.9	20.06	13.56	20.20	5.16	19 41 52.57
27	148	65 50 39.5	143.95	+0.68	0.005 8344	+31.1	20.20	+13.59	20.19	5.14	19 37 56.66
28	149	66 48 13.8	143.91	0.70	0.005 9079	30.2	20.34	13.63	20.19	5.12	19 34 0.75
29	150	67 45 47.1	143.87	0.69	0.005 9792	29.3	20.48	13.66	20.18	5.09	19 30 4.84
30	151	68 43 19.5	143.83	0.65	0.006 0483	28.4	20.61	13.70	20.18	5.07	19 26 8.93
31	152	69 40 50.9	143.79	0.59	0.006 1151	27.4	20.75	13.74	20.18	5.05	19 22 13.01
June 1	153	70 38 21.3	143.74	+0.51	0.006 1796	+26.4	20.89	+13.78	20.17	5.03	19 18 17.10
2	154	71 35 50.6	143.70	0.42	0.006 2418	25.4	21.03	13.82	20.17	5.01	19 14 21.19
3	155	72 33 18.8	143.65	0.31	0.006 3016	24.5	21.16	13.86	20.17	4.99	19 10 25.28
4	156	73 30 46.0	143.61	0.18	0.006 3592	23.5	21.30	13.90	20.16	4.97	19 6 29.37
5	157	74 28 12.0	143.56	+0.05	0.006 4146	22.6	21.44	13.94	20.16	4.96	19 2 33.46
6	158	75 25 37.0	143.52	−0.07	0.006 4678	+21.7	21.58	+13.98	20.16	4.94	18 58 37.54
7	159	76 23 0.9	143.47	0.18	0.006 5188	20.8	21.71	14.02	20.16	4.92	18 54 41.63
8	160	77 20 23.7	143.43	0.28	0.006 5678	20.0	21.85	14.06	20.15	4.90	18 50 45.72
9	161	78 17 45.4	143.38	0.36	0.006 6149	19.2	21.98	14.11	20.15	4.88	18 46 49.81
10	162	79 15 6.1	143.34	0.42	0.006 6602	18.5	22.12	14.15	20.15	4.87	18 42 53.90
11	163	80 12 25.7	143.30	−0.44	0.006 7037	+17.8	22.26	+14.20	20.15	4.86	18 38 57.98
12	164	81 9 44.4	143.26	0.43	0.006 7456	17.2	22.40	14.24	20.14	4.84	18 35 2.07
13	165	82 7 2.1	143.22	0.40	0.006 7860	16.6	22.54	14.29	20.14	4.83	18 31 6.16
14	166	83 4 19.1	143.19	0.34	0.006 8250	16.0	22.67	14.34	20.14	4.81	18 27 10.25
15	167	84 1 35.2	143.16	0.25	0.006 8627	15.4	22.81	14.38	20.14	4.80	18 23 14.33
16	168	84 58 50.8	143.14	−0.13	0.006 8991	+14.9	22.95	+14.43	20.14	4.79	18 19 18.42
17	169	85 56 5.8	143.12	+0.01	0.006 9342	14.4	23.09	14.47	20.14	4.78	18 15 22.51
18	170	86 53 20.5	143.10	0.15	0.006 9680	13.8	23.23	14.52	20.14	4.77	18 11 26.60
19	171	87 50 34.8	143.09	0.28	0.007 0003	13.1	23.36	14.57	20.14	4.76	18 7 30.68
20	172	88 47 49.0	143.09	0.41	0.007 0311	12.4	23.50	14.62	20.14	4.75	18 3 34.77
21	173	89 45 3.0	143.08	+0.52	0.007 0601	+11.7	23.64	+14.66	20.14	4.74	17 59 38.86
22	174	90 42 16.8	143.08	0.60	0.007 0872	10.9	23.78	14.71	20.14	4.73	17 55 42.95
23	175	91 39 30.6	143.07	0.66	0.007 1123	10.0	23.92	14.76	20.14	4.73	17 51 47.04
24	176	92 36 44.4	143.07	0.69	0.007 1353	9.1	24.05	14.81	20.14	4.72	17 47 51.12
25	177	93 33 58.1	143.07	0.69	0.007 1560	8.1	24.19	14.85	20.13	4.71	17 43 55.21
26	178	94 31 11.7	143.07	+0.66	0.007 1744	+ 7.1	24.33	+14.90	20.13	4.71	17 39 59.30
27	179	95 28 25.3	143.06	0.61	0.007 1902	6.1	24.47	14.95	20.13	4.70	17 36 3.39
28	180	96 25 38.8	143.06	0.51	0.007 2036	5.1	24.60	14.99	20.13	4.70	17 32 7.47
29	181	97 22 52.3	143.06	0.40	0.007 2145	4.0	24.74	15.04	20.13	4.69	17 28 11.56
30	182	98 20 5.6	143.05	0.29	0.007 2228	2.9	24.88	15.08	20.13	4.69	17 24 15.65
ly 1	183	99 17 18.8	143.05	+0.17	0.007 2285	+ 1.9	25.02	+15.12	20.13	4.68	17 20 19.74
2	184	100 14 31.9	143.04	+0.04	0.007 2316	+ 0.8	25.16	+15.17	20.13	4.68	17 16 23.82

FOR GREENWICH MEAN NOON.

Date.	Day of the Week.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Semi-diameter.	Hor. Par.	Equation of Time. App.—Mean.	Var. per Hour.	Sidereal Ti[illegible] or Right A[illegible] sion of Me[illegible] Sun.
		h m s	s	° ′ ″	″	′ ″	″	m s	s	h m s
July 1	Sa	6 40 24.54	10.344	+23 7 34.5	− 9.99	15 45.63	8.66	−3 35.18	−0.488	6 36 49.36
2	Su	6 44 32.68	10.333	23 3 22.6	11.00	15 45.62	8.66	3 46.76	0.477	6 40 45.92
3	Mo	6 48 40.54	10.321	22 58 46.5	12.00	15 45.62	8.65	3 58.06	0.464	6 44 42.48
4	Tu	6 52 48.09	10.308	22 53 46.4	13.00	15 45.62	8.65	4 9.05	0.451	6 48 39.04
5	We	6 56 55.32	10.294	22 48 22.4	13.99	15 45.63	8.65	4 19.72	0.437	6 52 35.60
6	Th	7 1 2.19	10.279	+22 42 34.6	−14.98	15 45.65	8.65	−4 30.04	−0.422	6 56 32.15
7	Fr	7 5 8.69	10.263	22 36 23.2	15.96	15 45.67	8.65	4 39.98	0.406	7 0 28.71
8	Sa	7 9 14.80	10.246	22 29 48.4	16.93	15 45.69	8.65	4 49.53	0.389	7 4 25.27
9	Su	7 13 20.50	10.229	22 22 50.4	17.90	15 45.72	8.66	4 58.68	0.372	7 8 21.83
10	Mo	7 17 25.77	10.211	22 15 29.2	18.86	15 45.75	8.66	5 7.39	0.354	7 12 18.38
11	Tu	7 21 30.60	10.192	+22 7 45.1	−19.81	15 45.79	8.66	−5 15.66	−0.335	7 16 14.94
12	We	7 25 34.97	10.172	21 59 38.3	20.75	15 45.83	8.66	5 23.47	0.316	7 20 11.50
13	Th	7 29 38.86	10.152	21 51 8.9	21.69	15 45.88	8.66	5 30.80	0.296	7 24 8.06
14	Fr	7 33 42.28	10.132	21 42 17.2	22.62	15 45.93	8.66	5 37.66	0.276	7 28 4.62
15	Sa	7 37 45.21	10.112	21 33 3.2	23.54	15 45.98	8.66	5 44.03	0.255	7 32 1.17
16	Su	7 41 47.64	10.091	+21 23 27.2	−24.45	15 46.03	8.66	−5 49.90	−0.234	7 35 57.73
17	Mo	7 45 49.56	10.070	21 13 29.4	25.36	15 46.09	8.66	5 55.27	0.213	7 39 54.29
18	Tu	7 49 50.97	10.048	21 3 10.0	26.26	15 46.14	8.66	6 0.13	0.192	7 43 50.85
19	We	7 53 51.87	10.026	20 52 29.1	27.14	15 46.20	8.66	6 4.47	0.170	7 47 47.40
20	Th	7 57 52.24	10.004	20 41 27.1	28.02	15 46.26	8.66	6 8.28	0.148	7 51 43.96
21	Fr	8 1 52.08	9.982	+20 30 4.1	−28.89	15 46.33	8.66	−6 11.56	−0.125	7 55 40.52
22	Sa	8 5 51.37	9.959	20 18 20.3	29.75	15 46.40	8.66	6 14.30	0.102	7 59 37.08
23	Su	8 9 50.11	9.936	20 6 16.1	30.60	15 46.48	8.66	6 16.48	0.079	8 3 33.63
24	Mo	8 13 48.29	9.912	19 53 51.6	31.44	15 46.57	8.66	6 18.10	0.056	8 7 30.19
25	Tu	8 17 45.90	9.888	19 41 7.1	32.26	15 46.66	8.66	6 19.16	0.032	8 11 26.75
26	We	8 21 42.94	9.864	+19 28 2.9	−33.07	15 46.76	8.67	−6 19.64	−0.008	8 15 23.30
27	Th	8 25 39.39	9.840	19 14 39.3	33.88	15 46.86	8.67	6 19.53	+0.017	8 19 19.86
28	Fr	8 29 35.25	9.815	19 0 56.6	34.67	15 46.96	8.67	6 18.84	0.042	8 23 16.41
29	Sa	8 33 30.52	9.790	18 46 55.0	35.45	15 47.07	8.67	6 17.54	0.067	8 27 12.97
30	Su	8 37 25.18	9.765	18 32 34.8	36.22	15 47.18	8.67	6 15.65	0.092	8 31 9.53
31	Mo	8 41 19.24	9.740	+18 17 56.4	−36.98	15 47.30	8.67	−6 13.15	+0.117	8 35 6.08
Aug. 1	Tu	8 45 12.68	9.714	18 3 0.0	37.72	15 47.42	8.67	6 10.04	0.142	8 39 2.64
2	We	8 49 5.51	9.688	17 47 45.9	38.45	15 47.55	8.67	6 6.31	0.168	8 42 59.20
3	Th	8 52 57.73	9.663	17 32 14.5	39.16	15 47.68	8.67	6 1.97	0.194	8 46 55.75
4	Fr	8 56 49.33	9.637	17 16 26.1	39.87	15 47.82	8.68	5 57.02	0.219	8 50 52.31
5	Sa	9 0 40.31	9.611	+17 0 21.0	−40.56	15 47.96	8.68	−5 51.45	+0.245	8 54 48.86
6	Su	9 4 30.68	9.586	16 43 59.4	41.23	15 48.11	8.68	5 45.26	0.271	8 58 45.42
7	Mo	9 8 20.43	9.560	16 27 21.7	41.90	15 48.26	8.68	5 38.45	0.296	9 2 41.98
8	Tu	9 12 9.57	9.535	16 10 28.2	42.55	15 48.42	8.68	5 31.04	0.321	9 6 38.53
9	We	9 15 58.11	9.510	15 53 19.3	43.19	15 48.58	8.68	5 23.03	0.346	9 10 35.09
10	Th	9 19 46.06	9.486	+15 35 55.1	−43.82	15 48.74	8.68	−5 14.42	+0.371	9 14 31.64
11	Fr	9 23 33.42	9.462	15 18 16.0	44.43	15 48.90	8.68	5 5.22	0.395	9 18 28.20
12	Sa	9 27 20.21	9.438	15 0 22.3	45.04	15 49.07	8.69	4 55.45	0.419	9 22 24.76
13	Su	9 31 6.43	9.415	14 42 14.2	45.63	15 49.24	8.69	4 45.12	0.442	9 26 21.31
14	Mo	9 34 52.10	9.392	14 23 52.0	46.21	15 49.41	8.69	4 34.24	0.465	9 30 17.86
15	Tu	9 38 37.24	9.370	+14 5 16.1	−46.78	15 49.58	8.69	−4 22.82	+0.487	9 34 14.42
16	We	9 42 21.86	9.348	+13 46 26.7	−47.34	15 49.76	8.69	−4 10.88	+0.508	9 38 10.98

FOR GREENWICH MEAN NOON.

Date.	Day of the Year.	True Longitude.	Var. per Hour.	Latitude.	Logarithm of the Radius Vector of the Earth.	Var. per Hour.	Prec. in Long.	Nut. in Long.	Aberration.	True Obliquity.	Mean Time of Sidereal Noon.
		° ′ ″	″	″			″	″	″	23° 27′ ″	h m s
July 1	183	99 17 18.8	143.05	+0.17	0.007 2285	+ 1.9	25.02	+15.12	20.13	4.68	17 20 19.74
2	184	100 14 31.9	143.04	+0.04	0.007 2316	+ 0.8	25.15	15.17	20.13	4.68	17 16 23.82
3	185	101 11 44.9	143.04	−0.09	0.007 2322	− 0.3	25.29	15.21	20.13	4.68	17 12 27.91
4	186	102 8 57.7	143.03	0.22	0.007 2303	1.3	25.42	15.26	20.13	4.68	17 8 32.00
5	187	103 6 10.3	143.02	0.33	0.007 2259	2.3	25.56	15.30	20.13	4.68	17 4 36.09
6	188	104 3 22.8	143.02	−0.42	0.007 2192	− 3.3	25.70	+15.34	20.13	4.68	17 0 40.18
7	189	105 0 35.1	143.01	0.48	0.007 2101	4.2	25.84	15.38	20.13	4.68	16 56 44.26
8	190	105 57 47.2	143.00	0.51	0.007 1989	5.1	25.98	15.43	20.13	4.68	16 52 48.35
9	191	106 54 59.2	143.00	0.52	0.007 1857	5.9	26.11	15.47	20.13	4.68	16 48 52.44
10	192	107 52 11.1	142.99	0.50	0.007 1705	6.7	26.25	15.51	20.13	4.68	16 44 56.53
11	193	108 49 23.0	142.99	−0.44	0.007 1536	− 7.4	26.39	+15.55	20.13	4.68	16 41 0.62
12	194	109 46 34.8	143.00	0.35	0.007 1350	8.1	26.53	15.58	20.13	4.68	16 37 4.70
13	195	110 43 46.7	143.00	0.23	0.007 1149	8.7	26.67	15.62	20.13	4.69	16 33 8.79
14	196	111 40 58.8	143.01	−0.10	0.007 0934	9.3	26.80	15.66	20.13	4.69	16 29 12.88
15	197	112 38 11.1	143.02	+0.04	0.007 0705	9.8	26.94	15.70	20.13	4.70	16 25 16.97
16	198	113 35 23.9	143.04	+0.18	0.007 0463	−10.4	27.08	+15.73	20.14	4.70	16 21 21.06
17	199	114 32 37.1	143.06	0.31	0.007 0208	11.0	27.22	15.76	20.14	4.71	16 17 25.15
18	200	115 29 51.0	143.09	0.43	0.006 9938	11.6	27.36	15.80	20.14	4.71	16 13 29.24
19	201	116 27 5.5	143.12	0.53	0.006 9653	12.2	27.49	15.83	20.14	4.72	16 9 33.32
20	202	117 24 20.9	143.16	0.61	0.006 9351	12.9	27.63	15.86	20.14	4.72	16 5 37.41
21	203	118 21 37.1	143.19	+0.65	0.006 9031	−13.7	27.77	+15.89	20.14	4.73	16 1 41.50
22	204	119 18 54.1	143.23	0.66	0.006 8692	14.5	27.91	15.92	20.15	4.73	15 57 45.59
23	205	120 16 12.0	143.26	0.64	0.006 8333	15.4	28.04	15.94	20.15	4.74	15 53 49.68
24	206	121 13 30.8	143.30	0.59	0.006 7952	16.3	28.18	15.97	20.15	4.75	15 49 53.77
25	207	122 10 50.4	143.34	0.51	0.006 7549	17.3	28.32	16.00	20.15	4.75	15 45 57.86
26	208	123 8 11.0	143.37	+0.42	0.006 7124	−18.2	28.46	+16.02	20.15	4.76	15 42 1.95
27	209	124 5 32.4	143.41	0.31	0.006 6674	19.2	28.59	16.04	20.16	4.77	15 38 6.04
28	210	125 2 54.7	143.45	0.18	0.006 6202	20.2	28.73	16.06	20.16	4.78	15 34 10.12
29	211	126 0 17.8	143.48	+0.05	0.006 5705	21.2	28.86	16.08	20.16	4.79	15 30 14.21
30	212	126 57 41.9	143.52	−0.08	0.006 5184	22.2	29.00	16.10	20.16	4.79	15 26 18.30
31	213	127 55 6.7	143.55	−0.20	0.006 4639	−23.3	29.14	+16.12	20.17	4.80	15 22 22.39
g. 1	214	128 52 32.3	143.58	0.31	0.006 4070	24.3	29.28	16.13	20.17	4.81	15 18 26.48
2	215	129 49 58.7	143.62	0.40	0.006 3478	25.2	29.42	16.15	20.17	4.82	15 14 30.57
3	216	130 47 25.9	143.65	0.47	0.006 2863	26.1	29.55	16.16	20.17	4.83	15 10 34.66
4	217	131 44 53.8	143.68	0.51	0.006 2227	27.0	29.69	16.17	20.18	4.84	15 6 38.75
5	218	132 42 22.5	143.71	−0.52	0.006 1569	−27.8	29.83	+16.18	20.18	4.85	15 2 42.84
6	219	133 39 51.9	143.74	0.50	0.006 0892	28.6	29.97	16.19	20.18	4.86	14 58 46.93
7	220	134 37 22.0	143.77	0.45	0.006 0197	29.3	30.11	16.20	20.19	4.87	14 54 51.02
8	221	135 34 53.0	143.81	0.37	0.005 9485	30.0	30.24	16.20	20.19	4.88	14 50 55.11
9	222	136 32 24.7	143.84	0.27	0.005 8759	30.6	30.38	16.20	20.19	4.89	14 46 59.20
10	223	137 29 57.3	143.88	−0.14	0.005 8018	−31.1	30.52	+16.21	20.20	4.90	14 43 3.29
11	224	138 27 30.8	143.92	0.00	0.005 7266	31.6	30.66	16.21	20.20	4.91	14 39 7.38
12	225	139 25 5.4	143.96	+0.14	0.005 6504	32.0	30.80	16.21	20.20	4.92	14 35 11.47
13	226	140 22 41.0	144.01	0.27	0.005 5731	32.4	30.93	16.21	20.20	4.93	14 31 15.56
14	227	141 20 18.0	144.06	0.40	0.005 4949	32.8	31.07	16.20	20.21	4.93	14 27 19.66
15	228	142 17 56.2	144.12	+0.51	0.005 4158	−33.2	31.21	+16.20	20.21	4.94	14 23 23.75
16	229	143 15 35.9	144.18	+0.59	0.005 3356	−33.6	31.35	+16.20	20.21	4.95	14 19 27.84

FOR GREENWICH MEAN NOON.

Date.	Day of the Week.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Semi-diameter.	Hor. Par.	Equation of Time. App.—Mean.	Var. per Hour.	Sid or H sic
		h m s	s	° ′ ″	″	′ ″	″	m s	s	h
Aug. 16	We	9 42 21.86	9.348	+13 46 26.7	−47.34	15 49.76	8.69	− 4 10.88	+0.508	9
17	Th	9 46 5.96	9.327	13 27 24.0	47.88	15 49.94	8.69	3 58.43	0.529	9
18	Fr	9 49 49.57	9.307	13 8 8.4	48.41	15 50.12	8.70	3 45.49	0.549	9
19	Sa	9 53 32.70	9.287	12 48 40.2	48.93	15 50.30	8.70	3 32.06	0.569	9
20	Su	9 57 15.36	9.268	12 28 59.6	49.44	15 50.49	8.70	3 18.17	0.588	9
21	Mo	10 0 57.56	9.249	+12 9 7.1	−49.93	15 50.68	8.70	− 3 3.81	+0.607	9
22	Tu	10 4 39.32	9.231	11 49 2.9	50.41	15 50.87	8.70	2 49.01	0.626	10
23	We	10 8 20.64	9.213	11 28 47.4	50.88	15 51.07	8.70	2 33.78	0.644	10
24	Th	10 12 1.53	9.195	11 8 20.8	51.33	15 51.27	8.71	2 18.12	0.661	10
25	Fr	10 15 42.01	9.178	10 47 43.6	51.77	15 51.47	8.71	2 2.05	0.678	10
26	Sa	10 19 22.10	9.162	+10 26 56.0	−52.19	15 51.68	8.71	− 1 45.58	+0.694	10
27	Su	10 23 1.79	9.146	10 5 58.4	52.60	15 51.89	8.71	1 28.72	0.710	10
28	Mo	10 26 41.11	9.131	9 44 51.2	53.00	15 52.11	8.71	1 11.48	0.725	10
29	Tu	10 30 20.07	9.116	9 23 34.6	53.38	15 52.33	8.72	0 53.89	0.740	10
30	We	10 33 58.68	9.102	9 2 9.1	53.74	15 52.55	8.72	0 35.94	0.754	10
31	Th	10 37 36.95	9.088	+ 8 40 35.0	−54.09	15 52.78	8.72	− 0 17.66	+0.768	10
Sept. 1	Fr	10 41 14.90	9.075	8 18 52.6	54.43	15 53.01	8.72	+ 0 0.94	0.781	10
2	Sa	10 44 52.54	9.062	7 57 2.2	54.73	15 53.24	8.72	0 19.86	0.794	10
3	Su	10 48 29.88	9.050	7 35 4.3	55.06	15 53.48	8.73	0 39.07	0.806	10
4	Mo	10 52 6.94	9.039	7 12 59.2	55.36	15 53.72	8.73	0 58.57	0.817	10
5	Tu	10 55 43.74	9.028	+ 6 50 47.1	−55.64	15 53.97	8.73	+ 1 18.32	+0.828	10
6	We	10 59 20.29	9.018	6 28 28.4	55.91	15 54.22	8.73	1 38.33	0.838	11
7	Th	11 2 56.61	9.009	6 6 3.4	56.16	15 54.47	8.74	1 58.56	0.847	11
8	Fr	11 6 32.72	9.001	5 43 32.5	56.41	15 54.72	8.74	2 19.00	0.855	11
9	Sa	11 10 8.65	8.994	5 20 55.9	56.64	15 54.97	8.74	2 39.63	0.863	11
10	Su	11 13 44.41	8.987	+ 4 58 13.9	−56.85	15 55.22	8.74	+ 3 0.42	+0.869	11
11	Mo	11 17 20.03	8.982	4 35 26.9	57.06	15 55.47	8.74	3 21.35	0.874	11
12	Tu	11 20 55.53	8.977	4 12 35.1	57.25	15 55.72	8.75	3 42.41	0.879	11
13	We	11 24 30.93	8.973	3 49 38.8	57.43	15 55.98	8.75	4 3.56	0.883	11
14	Th	11 28 6.27	8.971	3 26 38.4	57.60	15 56.23	8.75	4 24.77	0.885	11
15	Fr	11 31 41.56	8.970	+ 3 3 34.1	−57.75	15 56.49	8.75	+ 4 46.04	+0.886	11
16	Sa	11 35 16.82	8.969	2 40 26.2	57.89	15 56.74	8.76	5 7.33	0.887	11
17	Su	11 38 52.07	8.970	2 17 15.0	58.02	15 57.00	8.76	5 28.63	0.887	11
18	Mo	11 42 27.34	8.971	1 54 1.0	58.14	15 57.25	8.76	5 49.91	0.886	11
19	Tu	11 46 2.66	8.973	1 30 44.4	58.24	15 57.51	8.76	6 11.15	0.884	11
20	We	11 49 38.04	8.976	+ 1 7 25.6	−58.32	15 57.77	8.77	+ 6 32.33	+0.881	11
21	Th	11 53 13.49	8.979	0 44 4.9	58.39	15 58.04	8.77	6 53.43	0.877	12
22	Fr	11 56 49.03	8.984	+ 0 20 42.6	58.45	15 58.30	8.78	7 14.44	0.873	12
23	Sa	12 0 24.69	8.989	− 0 2 40.8	58.49	15 58.57	8.78	7 35.33	0.868	12
24	Su	12 4 0.49	8.995	0 26 5.0	58.52	15 58.84	8.78	7 56.08	0.862	12
25	Mo	12 7 36.45	9.002	− 0 49 29.7	−58.53	15 59.11	8.78	+ 8 16.68	+0.855	12
26	Tu	12 11 12.57	9.009	1 12 54.5	58.53	15 59.38	8.78	8 37.11	0.847	12
27	We	12 14 48.88	9.017	1 36 19.0	58.51	15 59.65	8.78	8 57.35	0.839	12
28	Th	12 18 25.40	9.026	1 59 42.8	58.47	15 59.92	8.79	9 17.38	0.830	12
29	Fr	12 22 2.15	9.036	2 23 5.6	58.42	16 0.20	8.79	9 37.19	0.820	12
30	Sa	12 25 39.13	9.046	− 2 46 27.0	−58.35	16 0.48	8.79	+ 9 56.76	+0.810	12
Oct. 1	Su	12 29 16.37	9.057	− 3 9 46.6	−58.27	16 0.76	8.79	+10 16.08	+0.799	12

FOR GREENWICH MEAN NOON.

Date.	Day of the Year.	True Longitude.	Var. per Hour.	Latitude.	Logarithm of the Radius Vector of the Earth.	Var. per Hour.	Prec. in Long.	Nut. in Long.	Aberration.	True Obliquity.	Mean Time of Sidereal Noon.
		° ′ ″	″	″			″	″	″	23° 27′ ″	h m s
Aug. 16	229	143 15 35.9	144.18	+0.59	0.005 3356	−33.6	31.35	+16.20	20.21	4.95	14 19 27.84
17	230	144 13 17.1	144.25	0.64	0.005 2543	34.1	31.48	16.19	20.22	4.96	14 15 31.93
18	231	145 10 59.9	144.32	0.66	0.005 1719	34.6	31.62	16.18	20.22	4.97	14 11 36.02
19	232	146 8 44.3	144.39	0.65	0.005 0882	35.2	31.76	16.17	20.22	4.97	14 7 40.11
20	233	147 6 30.4	144.46	0.61	0.005 0031	35.8	31.90	16.16	20.23	4.98	14 3 44.20
21	234	148 4 18.2	144.53	+0.55	0.004 9166	−36.4	32.03	+16.15	20.23	4.99	13 59 48.29
22	235	149 2 7.7	144.60	0.46	0.004 8284	37.1	32.17	16.14	20.23	5.00	13 55 52.38
23	236	149 59 58.9	144.67	0.35	0.004 7387	37.8	32.30	16.13	20.24	5.01	13 51 56.48
24	237	150 57 51.8	144.74	0.24	0.004 6472	38.5	32.44	16.11	20.24	5.01	13 48 0.57
25	238	151 55 46.3	144.81	+0.12	0.004 5540	39.2	32.58	16.09	20.25	5.02	13 44 4.66
26	239	152 53 42.6	144.88	−0.01	0.004 4590	−40.0	32.72	+16.08	20.25	5.02	13 40 8.75
27	240	153 51 40.5	144.95	0.13	0.004 3622	40.7	32.86	16.06	20.26	5.03	13 36 12.84
28	241	154 49 40.1	145.02	0.24	0.004 2636	41.5	32.99	16.04	20.26	5.04	13 32 16.93
29	242	155 47 41.2	145.08	0.34	0.004 1632	42.2	33.13	16.02	20.26	5.04	13 28 21.02
30	243	156 45 44.0	145.15	0.41	0.004 0610	43.0	33.27	16.00	20.27	5.05	13 24 25.12
31	244	157 43 48.3	145.21	−0.46	0.003 9570	−43.7	33.41	+15.98	20.27	5.05	13 20 29.21
pt. 1	245	158 41 54.1	145.27	0.48	0.003 8513	44.4	33.55	15.95	20.28	5.06	13 16 33.30
2	246	159 40 1.4	145.33	0.47	0.003 7440	45.0	33.68	15.93	20.28	5.06	13 12 37.39
3	247	160 38 10.1	145.39	0.43	0.003 6352	45.6	33.82	15.91	20.29	5.06	13 8 41.48
4	248	161 36 20.2	145.45	0.36	0.003 5252	46.1	33.96	15.88	20.29	5.06	13 4 45.58
5	249	162 34 31.8	145.51	−0.26	0.003 4139	−46.5	34.10	+15.85	20.30	5.07	13 0 49.67
6	250	163 32 44.8	145.57	0.14	0.003 3017	46.9	34.24	15.82	20.30	5.07	12 56 53.76
7	251	164 30 59.3	145.64	−0.01	0.003 1886	47.2	34.37	15.79	20.31	5.07	12 52 57.85
8	252	165 29 15.4	145.70	+0.13	0.003 0749	47.5	34.51	15.76	20.32	5.07	12 49 1.94
9	253	166 27 33.0	145.77	0.26	0.002 9607	47.7	34.65	15.73	20.32	5.07	12 45 6.04
10	254	167 25 52.2	145.84	+0.38	0.002 8461	−47.8	34.79	+15.70	20.33	5.07	12 41 10.13
11	255	168 24 13.1	145.91	0.49	0.002 7313	47.9	34.92	15.67	20.33	5.07	12 37 14.22
12	256	169 22 35.9	145.99	0.57	0.002 6163	48.0	35.05	15.63	20.34	5.06	12 33 18.32
13	257	170 21 0.6	146.07	0.63	0.002 5011	48.1	35.19	15.60	20.34	5.06	12 29 22.41
14	258	171 19 27.2	146.15	0.65	0.002 3857	48.2	35.33	15.57	20.35	5.06	12 25 26.50
15	259	172 17 55.9	146.24	+0.64	0.002 2701	−48.3	35.47	+15.53	20.36	5.05	12 21 30.59
16	260	173 16 26.8	146.33	0.61	0.002 1542	48.4	35.61	15.50	20.36	5.05	12 17 34.69
17	261	174 14 59.8	146.42	0.56	0.002 0378	48.6	35.74	15.46	20.37	5.04	12 13 38.78
18	262	175 13 35.0	146.51	0.48	0.001 9210	48.8	35.88	15.43	20.38	5.04	12 9 42.87
19	263	176 12 12.4	146.61	0.38	0.001 8036	49.0	36.02	15.39	20.38	5.03	12 5 46.96
20	264	177 10 52.1	146.70	+0.27	0.001 6856	−49.3	36.16	+15.36	20.39	5.02	12 1 51.06
21	265	178 9 33.9	146.79	0.15	0.001 5669	49.6	36.30	15.32	20.39	5.02	11 57 55.15
22	266	179 8 18.0	146.88	+0.03	0.001 4475	49.9	36.43	15.28	20.40	5.01	11 53 59.24
23	267	180 7 4.2	146.97	−0.09	0.001 3272	50.3	36.57	15.25	20.40	5.00	11 50 3.34
24	268	181 5 52.6	147.06	0.21	0.001 2062	50.6	36.71	15.21	20.41	4.99	11 46 7.43
25	269	182 4 43.2	147.15	−0.31	0.001 0842	−51.0	36.85	+15.17	20.41	4.98	11 42 11.52
26	270	183 3 35.9	147.24	0.38	0.000 9613	51.4	36.99	15.14	20.42	4.97	11 38 15.61
27	271	184 2 30.6	147.32	0.43	0.000 8375	51.8	37.12	15.10	20.42	4.96	11 34 19.71
28	272	185 1 27.3	147.40	0.46	0.000 7129	52.1	37.26	15.06	20.43	4.95	11 30 23.80
29	273	186 0 26.0	147.48	0.46	0.000 5873	52.5	37.40	15.03	20.43	4.93	11 26 27.89
30	274	186 59 26.6	147.56	−0.43	0.000 4610	−52.8	37.54	+14.99	20.44	4.92	11 22 31.98
1	275	187 58 29.0	147.64	−0.37	0.000 3340	−53.0	37.68	+14.96	20.44	4.90	11 18 36.08

FOR GREENWICH MEAN NOON.

Date.	Day of the Week.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Semi-diameter.	Hor. Par.	Equation of Time. App.—Mean.	Var. per Hour.	Sidereal Time or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	′ ″	″	m s	s	h m s
Oct. 1	Su	12 29 16.37	9.057	− 3 9 46.6	−58.27	16 0.76	8.79	+10 16.08	+0.799	12 39 32.45
2	Mo	12 32 53.89	9.069	3 33 4.0	58.17	16 1.04	8.80	10 35.11	0.787	12 43 29.00
3	Tu	12 36 31.69	9.082	3 56 18.9	58.06	16 1.32	8.80	10 53.86	0.774	12 47 25.55
4	We	12 40 9.80	9.095	4 19 31.0	57.93	16 1.60	8.80	11 12.30	0.761	12 51 22.11
5	Th	12 43 48.25	9.109	4 42 39.8	57.79	16 1.89	8.80	11 30.41	0.747	12 55 18.66
6	Fr	12 47 27.05	9.124	− 5 5 45.0	−57.63	16 2.18	8.81	+11 48.17	+0.732	12 59 15.21
7	Sa	12 51 6.22	9.140	5 28 46.3	57.46	16 2.46	8.81	12 5.55	0.716	13 3 11.77
8	Su	12 54 45.77	9.157	5 51 43.3	57.28	16 2.74	8.81	12 22.55	0.700	13 7 8.32
9	Mo	12 58 25.74	9.175	6 14 35.7	57.08	16 3.02	8.81	12 39.13	0.682	13 11 4.87
10	Tu	13 2 6.15	9.194	6 37 23.2	56.87	16 3.30	8.82	12 55.27	0.663	13 15 1.43
11	We	13 5 47.03	9.214	− 7 0 5.3	−56.64	16 3.58	8.82	+13 10.95	+0.643	13 18 57.98
12	Th	13 9 28.39	9.235	7 22 41.8	56.40	16 3.86	8.82	13 26.15	0.622	13 22 54.54
13	Fr	13 13 10.25	9.256	7 45 12.4	56.14	16 4.13	8.82	13 40.83	0.600	13 26 51.09
14	Sa	13 16 52.65	9.278	8 7 36.6	55.87	16 4.40	8.83	13 54.99	0.578	13 30 47.64
15	Su	13 20 35.60	9.301	8 29 54.0	55.58	16 4.67	8.83	14 8.60	0.555	13 34 44.20
16	Mo	13 24 19.12	9.326	− 8 52 4.4	−55.28	16 4.94	8.83	+14 21.63	+0.531	13 38 40.75
17	Tu	13 28 3.23	9.351	9 14 7.3	54.96	16 5.21	8.83	14 34.07	0.506	13 42 37.30
18	We	13 31 47.95	9.376	9 36 2.4	54.62	16 5.48	8.84	14 45.90	0.480	13 46 33.86
19	Th	13 35 33.30	9.403	9 57 49.2	54.27	16 5.74	8.84	14 57.11	0.453	13 50 30.41
20	Fr	13 39 19.29	9.430	10 19 27.4	53.90	16 6.01	8.84	15 7.67	0.426	13 54 26.97
21	Sa	13 43 5.94	9.458	−10 40 56.5	−53.51	16 6.27	8.84	+15 17.58	+0.398	13 58 23.52
22	Su	13 46 53.27	9.486	11 2 16.1	53.11	16 6.54	8.85	15 26.80	0.370	14 2 20.07
23	Mo	13 50 41.29	9.515	11 23 25.9	52.69	16 6.80	8.85	15 35.34	0.341	14 6 16.63
24	Tu	13 54 30.00	9.545	11 44 25.4	52.26	16 7.07	8.85	15 43.18	0.312	14 10 13.18
25	We	13 58 19.43	9.575	12 5 14.3	51.80	16 7.33	8.85	15 50.31	0.282	14 14 9.74
26	Th	14 2 9.59	9.605	−12 25 52.0	−51.33	16 7.59	8.85	+15 56.70	+0.252	14 18 6.29
27	Fr	14 6 0.48	9.636	12 46 18.2	50.84	16 7.85	8.86	16 2.37	0.221	14 22 2.85
28	Sa	14 9 52.11	9.667	13 6 32.4	50.33	16 8.11	8.86	16 7.29	0.190	14 25 59.40
29	Su	14 13 44.49	9.698	13 26 34.2	49.81	16 8.37	8.86	16 11.46	0.158	14 29 55.96
30	Mo	14 17 37.63	9.730	13 46 23.2	49.27	16 8.63	8.87	16 14.88	0.126	14 33 52.51
31	Tu	14 21 31.54	9.762	−14 5 59.0	−48.71	16 8.88	8.87	+16 17.53	+0.094	14 37 49.07
Nov. 1	We	14 25 26.22	9.794	14 25 21.2	48.13	16 9.14	8.87	16 19.40	0.062	14 41 45.62
2	Th	14 29 21.67	9.827	14 44 29.3	47.54	16 9.39	8.87	16 20.51	+0.030	14 45 42.18
3	Fr	14 33 17.91	9.860	15 3 23.0	46.93	16 9.65	8.87	16 20.82	−0.003	14 49 38.73
4	Sa	14 37 14.95	9.893	15 22 1.9	46.30	16 9.90	8.88	16 20.34	0.036	14 53 35.29
5	Su	14 41 12.79	9.927	−15 40 25.5	−45.66	16 10.15	8.88	+16 19.06	−0.070	14 57 31.84
6	Mo	14 45 11.44	9.961	15 58 33.5	45.00	16 10.40	8.88	16 16.96	0.104	15 1 28.40
7	Tu	14 49 10.91	9.995	16 16 25.4	44.32	16 10.64	8.88	16 14.05	0.139	15 5 24.96
8	We	14 53 11.20	10.030	16 34 1.0	43.63	16 10.87	8.89	16 10.31	0.174	15 9 21.51
9	Th	14 57 12.34	10.065	16 51 19.9	42.93	16 11.10	8.89	16 5.73	0.209	15 13 18.07
10	Fr	15 1 14.32	10.100	−17 8 21.6	−42.21	16 11.33	8.89	+16 0.31	−0.244	15 17 14.62
11	Sa	15 5 17.15	10.136	17 25 5.8	41.47	16 11.56	8.89	15 54.03	0.279	15 21 11.18
12	Su	15 9 20.83	10.171	17 41 32.0	40.71	16 11.78	8.89	15 46.91	0.315	15 25 7.74
13	Mo	15 13 25.37	10.207	17 57 39.9	39.94	16 12.00	8.90	15 38.92	0.351	15 29 4.29
14	Tu	15 17 30.78	10.243	18 13 29.1	39.15	16 12.21	8.90	15 30.07	0.387	15 33 0.85
15	We	15 21 37.04	10.279	−18 28 59.2	−38.35	16 12.42	8.90	+15 20.37	−0.423	15 36 57.41
16	Th	15 25 44.17	10.315	−18 44 9.8	−37.53	16 12.62	8.90	+15 9.80	−0.459	15 40 53.96

FOR GREENWICH MEAN NOON.

Date.	Day of the Year.	True Longitude.	Var. per Hour.	Latitude.	Logarithm of the Radius Vector of the Earth.	Var. per Hour.	Prec. in Long.	Nut. in Long.	Aberration.	True Obliquity.	Mean Time of Sidereal Noon.
		° ′ ″	″	″			″	″	″	23° 27′ ″	h m s
Oct. 1	275	187 58 29.0	147.64	−0.37	0.000 3340	−53.0	37.68	+14.96	20.44	4.90	11 18 36.08
2	276	188 57 33.3	147.71	0.28	0.000 2065	53.2	37.81	14.92	20.45	4.89	11 14 40.17
3	277	189 56 39.3	147.79	0.17	0.000 0785	53.3	37.95	14.89	20.45	4.88	11 10 44.26
4	278	190 55 47.0	147.86	−0.05	9.999 9503	53.4	38.09	14.85	20.46	4.86	11 6 48.36
5	279	191 54 56.5	147.93	+0.09	9.999 8221	53.4	38.23	14.82	20.47	4.85	11 2 52.45
6	280	192 54 7.8	148.00	+0.23	9.999 6940	−53.3	38.36	+14.79	20.47	4.83	10 58 56.54
7	281	193 53 20.8	148.08	0.35	9.999 5662	53.1	38.49	14.76	20.48	4.82	10 55 0.63
8	282	194 52 35.5	148.16	0.46	9.999 4389	52.9	38.63	14.73	20.49	4.80	10 51 4.72
9	283	195 51 52.2	148.24	0.54	9.999 3123	52.6	38.77	14.70	20.49	4.78	10 47 8.82
10	284	196 51 10.8	148.32	0.60	9.999 1863	52.3	38.91	14.67	20.50	4.76	10 43 12.91
11	285	197 50 31.4	148.40	+0.63	9.999 0612	−52.0	39.05	+14.64	20.50	4.74	10 39 17.00
12	286	198 49 54.0	148.49	0.63	9.998 9369	51.6	39.18	14.61	20.51	4.72	10 35 21.09
13	287	199 49 18.7	148.58	0.60	9.998 8134	51.2	39.32	14.58	20.52	4.70	10 31 25.18
14	288	200 48 45.7	148.67	0.54	9.998 6908	50.9	39.46	14.56	20.52	4.68	10 27 29.28
15	289	201 48 14.8	148.76	0.46	9.998 5689	50.6	39.60	14.53	20.53	4.66	10 23 33.37
16	290	202 47 46.3	148.86	+0.36	9.998 4477	−50.3	39.74	+14.51	20.53	4.64	10 19 37.46
17	291	203 47 20.0	148.95	0.25	9.998 3272	50.1	39.87	14.49	20.54	4.61	10 15 41.55
18	292	204 46 55.9	149.05	0.13	9.998 2072	49.9	40.01	14.47	20.55	4.59	10 11 45.65
19	293	205 46 34.2	149.14	+0.01	9.998 0878	49.7	40.15	14.45	20.55	4.56	10 7 49.74
20	294	206 46 14.6	149.23	−0.11	9.997 9689	49.5	40.29	14.43	20.56	4.54	10 3 53.83
21	295	207 45 57.4	149.33	−0.23	9.997 8504	−49.3	40.43	+14.41	20.56	4.51	9 59 57.92
22	296	208 45 42.4	149.42	0.33	9.997 7322	49.2	40.56	14.39	20.57	4.49	9 56 2.01
23	297	209 45 29.6	149.51	0.41	9.997 6142	49.1	40.70	14.37	20.58	4.47	9 52 6.10
24	298	210 45 18.9	149.60	0.46	9.997 4966	49.0	40.84	14.36	20.58	4.44	9 48 10.20
25	299	211 45 10.4	149.69	0.49	9.997 3791	48.9	40.98	14.35	20.59	4.42	9 44 14.29
26	300	212 45 3.9	149.77	−0.49	9.997 2617	−48.9	41.12	+14.33	20.59	4.40	9 40 18.38
27	301	213 44 59.4	149.85	0.46	9.997 1445	48.8	41.25	14.32	20.60	4.37	9 36 22.47
28	302	214 44 56.7	149.93	0.40	9.997 0275	48.7	41.39	14.31	20.60	4.35	9 32 26.56
29	303	215 44 55.9	150.00	0.31	9.996 9108	48.6	41.53	14.30	20.61	4.32	9 28 30.65
30	304	216 44 56.8	150.07	0.20	9.996 7943	48.4	41.67	14.30	20.62	4.29	9 24 34.74
31	305	217 44 59.4	150.14	−0.08	9.996 6784	−48.2	41.80	+14.29	20.62	4.26	9 20 38.83
v. 1	306	218 45 3.5	150.21	+0.05	9.996 5630	47.9	41.93	14.29	20.63	4.23	9 16 42.92
2	307	219 45 9.2	150.27	0.18	9.996 4485	47.5	42.07	14.29	20.63	4.21	9 12 47.02
3	308	220 45 16.5	150.33	0.31	9.996 3349	47.1	42.21	14.29	20.64	4.18	9 8 51.11
4	309	221 45 25.2	150.40	0.42	9.996 2225	46.6	42.35	14.29	20.64	4.15	9 4 55.20
5	310	222 45 35.5	150.46	+0.51	9.996 1114	−46.0	42.49	+14.30	20.65	4.12	9 0 59.29
6	311	223 45 47.4	150.53	0.57	9.996 0019	45.3	42.62	14.30	20.65	4.09	8 57 3.38
7	312	224 46 0.8	150.59	0.61	9.995 8939	44.6	42.76	14.31	20.66	4.06	8 53 7.47
8	313	225 46 15.8	150.66	0.62	9.995 7878	43.9	42.90	14.32	20.66	4.03	8 49 11.56
9	314	226 46 32.5	150.73	0.59	9.995 6834	43.1	43.04	14.33	20.66	4.00	8 45 15.65
10	315	227 46 50.8	150.80	+0.53	9.995 5809	−42.3	43.18	+14.34	20.67	3.97	8 41 19.74
11	316	228 47 11.0	150.87	0.45	9.995 4803	41.5	43.31	14.36	20.67	3.94	8 37 23.83
12	317	229 47 32.8	150.95	0.35	9.995 3815	40.7	43.45	14.37	20.68	3.91	8 33 27.92
13	318	230 47 56.5	151.02	0.23	9.995 2846	40.0	43.59	14.39	20.68	3.88	8 29 32.00
14	319	231 48 22.0	151.10	+0.11	9.995 1895	39.3	43.73	14.41	20.68	3.85	8 25 36.09
15	320	232 48 49.3	151.18	−0.01	9.995 0961	−38.6	43.87	+14.43	20.69	3.82	8 21 40.18
16	321	233 49 18.5	151.25	−0.13	9.995 0044	−37.9	44.00	+14.45	20.70	3.80	8 17 44.27

FOR GREENWICH MEAN NOON.

Date.	Day of the Week.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Semi-diameter.	Hor. Par.	Equation of Time. App.—Mean.	Var. per Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	′ ″	″	m s	s	h m s
Nov. 16	Th	15 25 44.17	10.315	−18 44 9.8	−37.53	16 12.62	8.90	+15 9.80	−0.459	15 40 53.96
17	Fr	15 29 52.15	10.350	18 59 0.5	36.69	16 12.82	8.90	14 58.37	0.494	15 44 50.52
18	Sa	15 34 0.98	10.386	19 13 30.9	35.84	16 13.02	8.91	14 46.10	0.529	15 48 47.08
19	Su	15 38 10.66	10.421	19 27 40.6	34.97	16 13.22	8.91	14 32.97	0.564	15 52 43.63
20	Mo	15 42 21.18	10.456	19 41 29.3	34.08	16 13.41	8.91	14 19.00	0.599	15 56 40.19
21	Tu	15 46 32.54	10.490	−19 54 56.6	−33.18	16 13.60	8.91	+14 4.21	−0.634	16 0 36.75
22	We	15 50 44.71	10.524	20 8 2.0	32.26	16 13.79	8.91	13 48.59	0.668	16 4 33.30
23	Th	15 54 57.69	10.557	20 20 45.3	31.33	16 13.98	8.92	13 32.17	0.701	16 8 29.86
24	Fr	15 59 11.46	10.590	20 33 6.0	30.39	16 14.16	8.92	13 14.96	0.734	16 12 26.42
25	Sa	16 3 26.00	10.622	20 45 3.8	29.42	16 14.34	8.92	12 56.97	0.766	16 16 22.97
26	Su	16 7 41.30	10.653	−20 56 38.4	−28.45	16 14.51	8.92	+12 38.23	−0.797	16 20 19.53
27	Mo	16 11 57.33	10.683	21 7 49.4	27.46	16 14.68	8.92	12 18.76	0.827	16 24 16.09
28	Tu	16 16 14.07	10.712	21 18 36.4	26.46	16 14.85	8.92	11 58.58	0.856	16 28 12.65
29	We	16 20 31.49	10.740	21 28 59.2	25.44	16 15.02	8.92	11 37.71	0.884	16 32 9.20
30	Th	16 24 49.59	10.767	21 38 57.5	24.41	16 15.18	8.93	11 16.17	0.911	16 36 5.76
Dec. 1	Fr	16 29 8.33	10.793	−21 48 30.9	−23.37	16 15.34	8.93	+10 53.99	−0.937	16 40 2.32
2	Sa	16 33 27.69	10.819	21 57 39.3	22.32	16 15.50	8.93	10 31.19	0.962	16 43 58.88
3	Su	16 37 47.66	10.844	22 6 22.3	21.26	16 15.66	8.93	10 7.78	0.987	16 47 55.44
4	Mo	16 42 8.20	10.867	22 14 39.6	20.18	16 15.81	8.93	9 43.80	1.011	16 51 52.00
5	Tu	16 46 29.30	10.890	22 22 31.1	19.10	16 15.95	8.93	9 19.26	1.034	16 55 48.55
6	We	16 50 50.93	10.912	−22 29 56.5	−18.01	16 16.09	8.93	+ 8 54.18	−1.056	16 59 45.11
7	Th	16 55 13.08	10.933	22 36 55.6	16.91	16 16.22	8.93	8 28.59	1.076	17 3 41.67
8	Fr	16 59 35.72	10.953	22 43 28.2	15.80	16 16.35	8.94	8 2.51	1.096	17 7 38.23
9	Sa	17 3 58.82	10.972	22 49 34.0	14.68	16 16.47	8.94	7 35.97	1.115	17 11 34.79
10	Su	17 8 22.37	10.990	22 55 12.8	13.55	16 16.59	8.94	7 8.98	1.133	17 15 31.35
11	Mo	17 12 46.33	11.007	−23 0 24.5	−12.42	16 16.70	8.94	+ 6 41.58	−1.150	17 19 27.90
12	Tu	17 17 10.68	11.022	23 5 8.9	11.28	16 16.80	8.94	6 13.78	1.166	17 23 24.46
13	We	17 21 35.39	11.037	23 9 25.9	10.13	16 16.90	8.94	5 45.63	1.180	17 27 21.02
14	Th	17 26 0.44	11.050	23 13 15.2	8.98	16 16.99	8.94	5 17.14	1.193	17 31 17.58
15	Fr	17 30 25.79	11.062	23 16 36.7	7.82	16 17.08	8.94	4 48.34	1.205	17 35 14.14
16	Sa	17 34 51.42	11.073	−23 19 30.4	− 6.65	16 17.16	8.94	+ 4 19.28	−1.216	17 39 10.70
17	Su	17 39 17.29	11.082	23 21 56.1	5.48	16 17.23	8.94	3 49.97	1.226	17 43 7.26
18	Mo	17 43 43.37	11.090	23 23 53.7	4.31	16 17.30	8.94	3 20.45	1.234	17 47 3.81
19	Tu	17 48 9.62	11.097	23 25 23.2	3.14	16 17.36	8.95	2 50.75	1.240	17 51 0.37
20	We	17 52 36.02	11.102	23 26 24.4	1.96	16 17.42	8.95	2 20.91	1.245	17 54 56.93
21	Th	17 57 2.52	11.106	−23 26 57.3	− 0.78	16 17.48	8.95	+ 1 50.97	−1.249	17 58 53.49
22	Fr	18 1 29.09	11.108	23 27 1.9	+ 0.40	16 17.54	8.95	1 20.96	1.251	18 2 50.05
23	Sa	18 5 55.70	11.108	23 26 38.2	1.58	16 17.59	8.95	0 50.91	1.252	18 6 46.61
24	Su	18 10 22.30	11.107	23 25 46.2	2.76	16 17.64	8.95	+ 0 20.87	1.251	18 10 43.17
25	Mo	18 14 48.85	11.104	23 24 25.8	3.94	16 17.68	8.95	− 0 9.12	1.248	18 14 39.72
26	Tu	18 19 15.31	11.100	−23 22 37.2	+ 5.12	16 17.72	8.95	− 0 39.03	−1.243	18 18 36.28
27	We	18 23 41.64	11.094	23 20 20.4	6.29	16 17.75	8.95	1 8.80	1.237	18 22 32.84
28	Th	18 28 7.81	11.086	23 17 35.5	7.46	16 17.78	8.95	1 38.41	1.230	18 26 29.40
29	Fr	18 32 33.78	11.077	23 14 22.6	8.62	16 17.81	8.95	2 7.82	1.221	18 30 25.96
30	Sa	18 36 59.51	11.066	23 10 41.7	9.78	16 17.83	8.95	2 36.99	1.210	18 34 22.52
31	Su	18 41 24.96	11.054	−23 6 33.0	+10.94	16 17.85	8.95	− 3 5.88	−1.198	18 38 19.07
32	Mo	18 45 50.11	11.041	−23 1 56.7	+12.09	16 17.87	8.95	− 3 34.47	−1.184	18 42 15.63

FOR GREENWICH MEAN NOON.

Date.	Day of the Year.	True Longitude.	Var. per Hour.	Latitude.	Logarithm of the Radius Vector of the Earth.	Var. per Hour.	Prec. in Long.	Nut. in Long.	Aberration.	True Obliquity.	Mean Time of Sidereal Noon.
		° ′ ″	″	″			″	″	″	23° 27′ ″	h m s
Nov. 16	321	233 49 18.5	151.25	−0.13	9.995 0044	−37.9	44.00	+14.45	20.70	3.80	8 17 44.27
17	322	234 49 49.4	151.33	0.25	9.994 9144	37.2	44.14	14.47	20.70	3.77	8 13 48.36
18	323	235 50 22.2	151.40	0.36	9.994 8259	36.6	44.28	14.49	20.71	3.75	8 9 52.45
19	324	236 50 56.7	151.48	0.44	9.994 7388	36.0	44.42	14.52	20.71	3.72	8 5 56.54
20	325	237 51 33.0	151.55	0.49	9.994 6533	35.4	44.55	14.54	20.72	3.70	8 2 0.63
21	326	238 52 11.0	151.62	−0.52	9.994 5690	−34.8	44.68	+14.57	20.72	3.67	7 58 4.72
22	327	239 52 50.7	151.69	0.53	9.994 4860	34.3	44.82	14.60	20.72	3.65	7 54 8.81
23	328	240 53 32.0	151.75	0.50	9.994 4041	33.8	44.96	14.63	20.73	3.63	7 50 12.90
24	329	241 54 14.7	151.81	0.44	9.994 3234	33.4	45.10	14.66	20.73	3.60	7 46 16.98
25	330	242 54 58.9	151.86	0.36	9.994 2437	33.0	45.24	14.70	20.74	3.57	7 42 21.07
26	331	243 55 44.4	151.92	−0.26	9.994 1651	−32.5	45.37	+14.73	20.74	3.55	7 38 25.16
27	332	244 56 31.1	151.97	−0.13	9.994 0876	32.0	45.51	14.77	20.74	3.53	7 34 29.25
28	333	245 57 18.9	152.01	+0.01	9.994 0113	31.5	45.65	14.80	20.75	3.50	7 30 33.34
29	334	246 58 7.8	152.05	0.15	9.993 9364	30.9	45.79	14.84	20.75	3.48	7 26 37.43
30	335	247 58 57.5	152.09	0.28	9.993 8629	30.3	45.93	14.88	20.75	3.46	7 22 41.52
Dec. 1	336	248 59 48.2	152.13	+0.39	9.993 7910	−29.6	46.06	+14.92	20.76	3.43	7 18 45.60
2	337	250 0 39.7	152.16	0.48	9.993 7209	28.8	46.20	14.96	20.76	3.41	7 14 49.69
3	338	251 1 31.9	152.19	0.55	9.993 6528	28.0	46.34	15.00	20.76	3.39	7 10 53.78
4	339	252 2 25.0	152.23	0.59	9.993 5868	27.1	46.48	15.05	20.76	3.37	7 6 57.86
5	340	253 3 18.9	152.26	0.60	9.993 5230	26.1	46.62	15.09	20.77	3.35	7 3 1.95
6	341	254 4 13.5	152.29	+0.58	9.993 4617	−25.1	46.75	+15.14	20.77	3.33	6 59 6.04
7	342	255 5 9.0	152.33	0.53	9.993 4028	24.0	46.89	15.19	20.77	3.31	6 55 10.13
8	343	256 6 5.3	152.36	0.45	9.993 3465	22.9	47.03	15.24	20.78	3.29	6 51 14.22
9	344	257 7 2.5	152.40	0.35	9.993 2928	21.8	47.17	15.29	20.78	3.27	6 47 18.30
10	345	258 8 0.6	152.44	0.24	9.993 2417	20.7	47.31	15.34	20.78	3.25	6 43 22.39
11	346	259 8 59.5	152.48	+0.12	9.993 1932	−19.7	47.41	+15.39	20.78	3.24	6 39 26.48
12	347	260 9 59.4	152.51	−0.01	9.993 1473	18.6	47.58	15.44	20.79	3.22	6 35 30.57
13	348	261 11 0.2	152.55	0.14	9.993 1039	17.6	47.72	15.49	20.79	3.20	6 31 34.65
14	349	262 12 1.8	152.59	0.26	9.993 0630	16.5	47.86	15.54	20.79	3.19	6 27 38.74
15	350	263 13 4.5	152.63	0.36	9.993 0246	15.5	47.99	15.60	20.80	3.18	6 23 42.83
16	351	264 14 8.0	152.67	−0.44	9.992 9886	−14.5	48.12	+15.65	20.80	3.16	6 19 46.92
17	352	265 15 12.4	152.70	0.50	9.992 9548	13.6	48.26	15.70	20.80	3.15	6 15 51.00
18	353	266 16 17.7	152.74	0.54	9.992 9232	12.7	48.40	15.76	20.80	3.14	6 11 55.09
19	354	267 17 23.9	152.77	0.55	9.992 8938	11.9	48.54	15.81	20.81	3.13	6 7 59.18
20	355	268 18 30.8	152.80	0.54	9.992 8663	11.1	48.68	15.86	20.81	3.12	6 4 3.26
21	356	269 19 38.5	152.83	−0.49	9.992 8407	−10.3	48.81	+15.92	20.81	3.11	6 0 7.35
22	357	270 20 46.8	152.86	0.41	9.992 8169	9.6	48.95	15.97	20.81	3.10	5 56 11.44
23	358	271 21 55.8	152.88	0.30	9.992 7947	8.9	49.09	16.03	20.81	3.09	5 52 15.52
24	359	272 23 5.2	152.90	0.17	9.992 7740	8.2	49.23	16.08	20.81	3.08	5 48 19.61
25	360	273 24 15.0	152.91	−0.04	9.992 7550	7.6	49.37	16.13	20.81	3.07	5 44 23.70
26	361	274 25 25.0	152.92	+0.10	9.992 7374	− 7.0	49.50	+16.18	20.81	3.07	5 40 27.79
27	362	275 26 35.1	152.92	0.24	9.992 7215	6.3	49.64	16.23	20.81	3.06	5 36 31.88
28	363	276 27 45.3	152.92	0.37	9.992 7073	5.5	49.78	16.28	20.81	3.06	5 32 35.96
29	364	277 28 55.4	152.92	0.47	9.992 6949	4.7	49.92	16.33	20.81	3.05	5 28 40.05
30	365	278 30 5.4	152.91	0.55	9.992 6845	3.9	50.06	16.39	20.81	3.05	5 24 44.14
31	366	279 31 15.2	152.90	+0.60	9.992 6762	− 3.0	50.19	+16.44	20.81	3.05	5 20 48.22
32	367	280 32 24.7	152.89	+0.62	9.992 6701	− 2.0	50.33	+16.49	20.81	3.04	5 16 52.31

GREENWICH MEAN TIME.

Date.	X True Equinox.		Reduc. to Mean Eq'x of 1916.0	Y True Equinox.		Reduc. to Mean Eq'x of 1916.0	Z True Equinox.		Reduc. to Mean Eq'x of 1916.0
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
Jan. 1	+0.166 6840	+0.175 2997	−632	−0.889 0088	−0.887 6115	−200	−0.385 6644	−0.385 0581	+189
2	0.183 9019	0.192 4900	639	0.886 1451	0.884 6092	212	0.384 4218	0.383 7553	183
3	0.201 0633	0.209 6211	646	0.883 0040	0.881 3297	224	0.383 0587	0.382 3321	177
4	0.218 1625	0.226 6870	652	0.879 5864	0.877 7742	236	0.381 5756	0.380 7891	171
5	0.235 1937	0.243 6820	658	0.875 8933	0.873 9439	248	0.379 9728	0.379 1268	164
6	+0.252 1511	+0.260 6004	−664	−0.871 9260	−0.869 8400	−260	−0.378 2510	−0.377 3457	+158
7	0.269 0291	0.277 4366	669	0.867 6860	0.865 4641	273	0.376 4109	0.375 4466	151
8	0.285 8221	0.294 1850	674	0.863 1746	0.860 8178	286	0.374 4531	0.373 4304	144
9	0.302 5246	0.310 8402	679	0.858 3939	0.855 9030	299	0.372 3785	0.371 2977	137
10	0.319 1312	0.327 3970	684	0.853 3455	0.850 7217	312	0.370 1880	0.369 0495	130
11	+0.335 6368	+0.343 8502	−688	−0.848 0316	−0.845 2757	−326	−0.367 8823	−0.366 6866	+123
12	0.352 0365	0.360 1950	692	0.842 4542	0.839 5672	339	0.365 4625	0.364 2100	116
13	0.368 3252	0.376 4264	695	0.836 6152	0.833 5982	353	0.362 9294	0.361 6206	108
14	0.384 4981	0.392 5396	698	0.830 5167	0.827 3708	367	0.360 2839	0.358 9192	101
15	0.400 5505	0.408 5300	700	0.824 1609	0.820 8872	381	0.357 5268	0.356 1068	93
16	+0.416 4776	+0.424 3927	−702	−0.817 5499	−0.814 1495	−395	−0.354 6593	−0.353 1843	+ 85
17	0.432 2748	0.440 1232	704	0.810 6860	0.807 1599	409	0.351 6821	0.350 1527	77
18	0.447 9374	0.455 7169	705	0.803 5714	0.799 9208	423	0.348 5963	0.347 0130	69
19	0.463 4611	0.471 1693	706	0.796 2084	0.792 4345	438	0.345 4028	0.343 7660	61
20	0.478 8411	0.486 4759	707	0.788 5993	0.784 7032	452	0.342 1026	0.340 4128	53
21	+0.494 0732	+0.501 6324	−707	−0.780 7464	−0.776 7293	−467	−0.338 6967	−0.336 9544	+ 45
22	0.509 1529	0.516 6342	707	0.772 6521	0.768 5152	482	0.335 1860	0.333 3917	36
23	0.524 0758	0.531 4770	706	0.764 3188	0.760 0632	496	0.331 5716	0.329 7258	28
24	0.538 8375	0.546 1565	705	0.755 7489	0.751 3759	511	0.327 8544	0.325 9577	19
25	0.553 4336	0.560 6682	703	0.746 9447	0.742 4556	526	0.324 0356	0.322 0884	11
26	+0.567 8598	+0.575 0077	−701	−0.737 9088	−0.733 3048	−540	−0.320 1161	−0.318 1189	+ 2
27	0.582 1114	0.589 1704	698	0.728 6438	0.723 9261	555	0.316 0970	0.314 0504	− 7
28	0.596 1842	0.603 1520	696	0.719 1522	0.714 3223	570	0.311 9794	0.309 8841	16
29	0.610 0734	0.616 9479	693	0.709 4368	0.704 4960	585	0.307 7646	0.305 6211	25
30	0.623 7747	0.630 5534	689	0.699 5004	0.694 4502	599	0.303 4537	0.301 2627	34
31	+0.637 2834	+0.643 9642	−685	−0.689 3460	−0.684 1880	−614	−0.299 0481	−0.296 8103	− 43
Feb. 1	0.650 5951	0.657 1756	680	0.678 9766	0.673 7124	629	0.294 5492	0.292 2652	53
2	0.663 7052	0.670 1832	675	0.668 3957	0.663 0270	643	0.289 9585	0.287 6291	62
3	0.676 6093	0.682 9827	669	0.657 6068	0.652 1353	658	0.285 2774	0.282 9035	71
4	0.689 3030	0.695 5698	663	0.646 6133	0.641 0410	672	0.280 5076	0.278 0899	80
5	+0.701 7825	+0.707 9406	−656	−0.635 4191	−0.629 7480	−686	−0.275 6508	−0.273 1903	− 90
6	0.714 0437	0.720 0912	649	0.624 0282	0.618 2602	700	0.270 7087	0.268 2062	99
7	0.726 0828	0.732 0181	642	0.612 4445	0.606 5816	714	0.265 6831	0.263 1396	109
8	0.737 8965	0.743 7177	635	0.600 6720	0.594 7163	728	0.260 5758	0.257 9921	118
9	0.749 4812	0.755 1866	627	0.588 7149	0.582 6684	742	0.255 3885	0.252 7654	128
10	+0.760 8336	+0.766 4218	−618	−0.576 5772	−0.570 4419	−756	−0.250 1230	−0.247 4615	−137
11	0.771 9507	0.777 4201	609	0.564 2630	0.558 0409	769	0.244 7811	0.242 0820	147
12	0.782 8295	0.788 1786	599	0.551 7762	0.545 4693	782	0.239 3645	0.236 6287	156
13	0.793 4669	0.798 6943	589	0.539 1209	0.532 7313	795	0.233 8749	0.231 1032	166
14	0.803 8602	0.808 9644	579	0.526 3011	0.519 8308	808	0.228 3140	0.225 5074	175
15	+0.814 0066	+0.818 9864	−568	−0.513 3210	−0.506 7720	−821	−0.222 6837	−0.219 8430	−185
16	+0.823 9034	+0.828 7575	−557	−0.500 1845	−0.493 5590	−834	−0.216 9856	−0.214 1118	−194

GREENWICH MEAN TIME.

Date.	X True Equinox.		Reduc. to Mean Eq'x of 1916.0	Y True Equinox.		Reduc. to Mean Eq'x of 1916.0	Z True Equinox.		Reduc. to Mean Eq'x of 1916.0
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
Feb. 16	+0.823 9034	+0.828 7575	−557	−0.500 1845	−0.493 5590	− 834	−0.216 9856	−0.214 1118	−194
17	0.833 5481	0.838 2751	546	0.486 8958	0.480 1956	846	0.211 2216	0.208 3153	204
18	0.842 9381	0.847 5368	534	0.473 4589	0.466 6861	858	0.205 3932	0.202 4554	213
19	0.852 0710	0.856 5402	522	0.459 8778	0.453 0344	870	0.199 5021	0.196 5337	223
20	0.860 9443	0.865 2828	509	0.446 1564	0.439 2444	882	0.193 5503	0.190 5520	232
21	+0.869 5556	+0.873 7622	−496	−0.432 2988	−0.425 3202	− 894	−0.187 5392	−0.184 5120	−242
22	0.877 9025	0.881 9762	483	0.418 3091	0.411 2659	905	0.181 4707	0.178 4154	251
23	0.885 9828	0.889 9222	469	0.404 1912	0.397 0855	916	0.175 3464	0.172 2639	261
24	0.893 7940	0.897 5980	455	0.389 9493	0.382 7830	927	0.169 1681	0.166 0592	270
25	0.901 3337	0.905 0010	441	0.375 5873	0.368 3626	937	0.162 9376	0.159 8033	279
26	+0.908 5995	+0.912 1288	−426	−0.361 1095	−0.353 8286	− 948	−0.156 6566	−0.153 4978	−288
27	0.915 5889	0.918 9792	411	0.346 5202	0.339 1852	958	0.150 3272	0.147 1448	297
28	0.922 2997	0.925 5499	396	0.331 8238	0.324 4369	967	0.143 9511	0.140 7462	306
29	0.928 7296	0.931 8385	380	0.317 0249	0.309 5884	977	0.137 5304	0.134 3040	316
Mar. 1	0.934 8764	0.937 8430	364	0.302 1280	0.294 6444	986	0.131 0672	0.127 8203	325
2	+0.940 7380	+0.943 5613	−348	−0.287 1381	−0.279 6096	− 995	−0.124 5636	−0.121 2973	−334
3	0.946 3127	0.948 9919	331	0.272 0598	0.264 4891	1004	0.118 0217	0.114 7371	342
4	0.951 5987	0.954 1330	314	0.256 8982	0.249 2877	1012	0.111 4438	0.108 1420	351
5	0.956 5946	0.958 9832	297	0.241 6583	0.234 0106	1020	0.104 8320	0.101 5142	360
6	0.961 2988	0.963 5413	279	0.226 3453	0.218 6629	1027	0.098 1886	0.094 8558	368
7	+0.965 7104	+0.967 8062	−262	−0.210 9640	−0.203 2494	−1034	−0.091 5158	−0.088 1691	−377
8	0.969 8285	0.971 7773	244	0.195 5197	0.187 7753	1041	0.084 8158	0.081 4562	385
9	0.973 6524	0.975 4537	225	0.180 0170	0.172 2454	1048	0.078 0906	0.074 7192	393
10	0.977 1812	0.978 8348	207	0.164 4611	0.156 6647	1054	0.071 3424	0.067 9604	401
11	0.980 4145	0.981 9202	188	0.148 8568	0.141 0380	1060	0.064 5734	0.061 1817	409
12	+0.983 3518	+0.984 7094	−169	−0.133 2089	−0.125 3701	−1066	−0.057 7855	−0.054 3852	−417
13	0.985 9929	0.987 2022	150	0.117 5222	0.109 6658	1072	0.050 9810	0.047 5730	425
14	0.988 3374	0.989 3983	131	0.101 8014	0.093 9297	1077	0.044 1617	0.040 7472	433
15	0.990 3851	0.991 2977	111	0.086 0512	0.078 1666	1082	0.037 3298	0.033 9096	440
16	0.992 1361	0.992 9003	91	0.070 2763	0.062 3810	1086	0.030 4871	0.027 0623	448
17	+0.993 5904	+0.994 2062	− 71	−0.054 4813	−0.046 5776	−1090	−0.023 6356	−0.020 2072	−455
18	0.994 7478	0.995 2152	50	0.038 6706	0.030 7609	1094	0.016 7773	0.013 3462	462
19	0.995 6085	0.995 9276	30	0.022 8489	−0.014 9353	1098	0.009 9141	−0.006 4812	469
20	0.996 1725	0.996 3434	− 9	−0.007 0205	+0.000 8948	1101	−0.003 0479	+0.000 3858	476
21	0.996 4401	0.996 4627	+ 12	+0.008 8102	0.016 7251	1104	+0.003 8195	0.007 2530	482
22	+0.996 4113	+0.996 2858	+ 33	+0.024 6389	+0.032 5511	−1107	+0.010 6861	+0.014 1185	−489
23	0.996 0862	0.995 8125	54	0.040 4612	0.048 3685	1109	0.017 5501	0.020 9804	495
24	0.995 4647	0.995 0428	75	0.056 2725	0.064 1727	1111	0.024 4095	0.027 8369	502
25	0.994 5470	0.993 9770	97	0.072 0684	0.079 9592	1112	0.031 2624	0.034 6858	508
26	0.993 3331	0.992 6153	118	0.087 8445	0.095 7235	1113	0.038 1068	0.041 5252	514
27	+0.991 8235	+0.990 9579	+140	+0.103 5959	+0.111 4609	−1114	+0.044 9406	+0.048 3529	−519
28	0.990 0184	0.989 0051	162	0.119 3180	0.127 1666	1115	0.051 7618	0.055 1670	525
29	0.987 9180	0.986 7573	184	0.135 0060	0.142 8358	1115	0.058 5682	0.061 9651	530
30	0.985 5230	0.984 2152	206	0.150 6551	0.158 4636	1115	0.065 3576	0.068 7453	535
31	0.982 8341	0.981 3797	228	0.166 2604	0.174 0451	1115	0.072 1280	0.075 5054	540
pr. 1	+0.979 8522	+0.978 2517	+251	+0.181 8170	+0.189 5754	−1114	+0.078 8771	+0.082 2430	−545
2	+0.976 5784	+0.974 8325	+273	+0.197 3198	+0.205 0494	−1114	+0.085 6028	+0.088 9562	−550

GREENWICH MEAN TIME.

Date.	X True Equinox.		Reduc. to Mean Eq'x of 1916.0	Y True Equinox.		Reduc. to Mean Eq'x of 1916.0	Z True Equinox.		Reduc. to Mean Eq'x of 1916.0
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
Apr. 1	+0.979 8522	+0.978 2517	+ 251	+0.181 8170	+0.189 5754	−1114	+0.078 8771	+0.082 2430	−545
2	0.976 5784	0.974 8325	273	0.197 3198	0.205 0494	1114	0.085 6028	0.088 9562	550
3	0.973 0140	0.971 1232	296	0.212 7639	0.220 4625	1113	0.092 3029	0.095 6427	554
4	0.969 1604	0.967 1256	319	0.228 1446	0.235 8097	1111	0.098 9753	0.102 3004	558
5	0.965 0191	0.962 8412	341	0.243 4571	0.251 0863	1109	0.105 6179	0.108 9275	562
6	+0.960 5920	+0.958 2717	+ 364	+0.258 6968	+0.266 2878	−1107	+0.112 2288	+0.115 5218	−566
7	0.955 8808	0.953 4193	387	0.273 8589	0.281 4095	1104	0.118 8060	0.122 0813	570
8	0.950 8875	0.948 2858	410	0.288 9391	0.296 4470	1101	0.125 3475	0.128 6043	573
9	0.945 6143	0.942 8732	433	0.303 9328	0.311 3960	1098	0.131 8514	0.135 0887	576
10	0.940 0630	0.937 1838	456	0.318 8359	0.326 2521	1095	0.138 3159	0.141 5328	579
11	+0.934 2359	+0.931 2196	+ 480	+0.333 6440	+0.341 0112	−1091	+0.144 7392	+0.147 9348	−582
12	0.928 1351	0.924 9828	503	0.348 3530	0.355 6690	1086	0.151 1194	0.154 2928	585
13	0.921 7630	0.918 4759	526	0.362 9587	0.370 2215	1082	0.157 4548	0.160 6051	587
14	0.915 1219	0.911 7012	550	0.377 4570	0.384 6648	1077	0.163 7437	0.166 8702	589
15	0.908 2142	0.904 6612	573	0.391 8442	0.398 9949	1072	0.169 9845	0.173 0863	591
16	+0.901 0424	+0.897 3581	+ 596	+0.406 1164	+0.413 2083	−1066	+0.176 1755	+0.179 2519	−593
17	0.893 6086	0.889 7943	620	0.420 2700	0.427 3012	1060	0.182 3152	0.185 3653	594
18	0.885 9153	0.881 9721	643	0.434 3012	0.441 2698	1054	0.188 4020	0.191 4250	595
19	0.877 9648	0.873 8939	667	0.448 2065	0.455 1107	1048	0.194 4343	0.197 4295	596
20	0.869 7595	0.865 5619	690	0.461 9820	0.468 8201	1041	0.200 4104	0.203 3770	597
21	+0.861 3014	+0.856 9784	+ 714	+0.475 6244	+0.482 3944	−1034	+0.206 3289	+0.209 2660	−598
22	0.852 5930	0.848 1455	737	0.489 1298	0.495 8299	1026	0.212 1882	0.215 0950	598
23	0.843 6363	0.839 0657	761	0.502 4943	0.509 1226	1018	0.217 9864	0.220 8622	598
24	0.834 4339	0.829 7414	784	0.515 7143	0.522 2688	1010	0.223 7220	0.226 5658	598
25	0.824 9884	0.820 1752	808	0.528 7858	0.535 2647	1001	0.229 3932	0.232 2041	597
26	+0.815 3022	+0.810 3697	+ 831	+0.541 7050	+0.548 1063	− 992	+0.234 9983	+0.237 7755	−597
27	0.805 3780	0.800 3275	855	0.554 4681	0.560 7898	983	0.240 5356	0.243 2782	596
28	0.795 2187	0.790 0519	878	0.567 0710	0.573 3112	973	0.246 0033	0.248 7106	595
29	0.784 8274	0.779 5459	902	0.579 5099	0.585 6667	963	0.251 3998	0.254 0708	594
30	0.774 2075	0.768 8128	925	0.591 7811	0.597 8526	953	0.256 7233	0.259 3572	592
May 1	+0.763 3621	+0.757 8560	+ 948	+0.603 8807	+0.609 8650	− 943	+0.261 9722	+0.264 5682	−590
2	0.752 2948	0.746 6790	972	0.615 8051	0.621 7004	932	0.267 1450	0.269 7023	588
3	0.741 0091	0.735 2856	995	0.627 5507	0.633 3554	921	0.272 2400	0.274 7579	586
4	0.729 5089	0.723 6794	1018	0.639 1141	0.644 8264	909	0.277 2558	0.279 7336	583
5	0.717 7978	0.711 8644	1041	0.650 4920	0.656 1104	897	0.282 1911	0.284 6281	580
6	+0.705 8797	+0.699 8442	+1064	+0.661 6812	+0.667 2040	− 885	+0.287 0445	+0.289 4400	−577
7	0.693 7584	0.687 6227	1087	0.672 6785	0.678 1042	872	0.291 8145	0.294 1679	574
8	0.681 4378	0.675 2041	1110	0.683 4809	0.688 8082	859	0.296 4999	0.298 8106	570
9	0.668 9220	0.662 5922	1133	0.694 0857	0.699 3131	846	0.301 0996	0.303 3669	567
10	0.656 2150	0.649 7911	1155	0.704 4900	0.709 6161	832	0.305 6123	0.307 8357	563
11	+0.643 3208	+0.636 8047	+1178	+0.714 6911	+0.719 7146	− 818	+0.310 0369	+0.312 2158	−558
12	0.630 2433	0.623 6371	1200	0.724 6864	0.729 6061	803	0.314 3723	0.316 5062	554
13	0.616 9866	0.610 2923	1222	0.734 4735	0.739 2883	788	0.318 6175	0.320 7060	549
14	0.603 5548	0.596 7744	1244	0.744 0501	0.748 7587	773	0.322 7716	0.324 8141	544
15	0.589 9517	0.583 0872	1266	0.753 4138	0.758 0152	758	0.326 8334	0.328 8295	539
16	+0.576 1813	+0.569 2346	+1288	+0.762 5625	+0.767 0556	− 742	+0.330 8022	+0.332 7514	−534
17	+0.562 2476	+0.555 2206	+1310	+0.771 4942	+0.775 8779	− 725	+0.334 6769	+0.336 5787	−528

GREENWICH MEAN TIME.

Date.	X True Equinox.		Reduc. to Mean Eq'x of 1916.0	Y True Equinox.		Reduc. to Mean Eq'x of 1916.0	Z True Equinox.		Reduc. to Mean Eq'x of 1916.0
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
May 17	+0.562 2476	+0.555 2206	+1310	+0.771 4942	+0.775 8779	−725	+0.334 6769	+0.336 5787	−528
18	0.548 1542	0.541 0487	1331	0.780 2066	0.784 4800	709	0.338 4567	0.340 3106	522
19	0.533 9047	0.526 7227	1352	0.788 6977	0.792 8596	692	0.342 1405	0.343 9462	516
20	0.519 5030	0.512 2461	1373	0.796 9653	0.801 0146	674	0.345 7276	0.347 4845	510
21	0.504 9526	0.497 6229	1394	0.805 0071	0.808 9426	656	0.349 2167	0.350 9243	503
22	+0.490 2576	+0.482 8570	+1415	+0.812 8208	+0.816 6414	−638	+0.352 6070	+0.354 2647	−496
23	0.475 4217	0.467 9522	1435	0.820 4041	0.824 1086	620	0.355 8973	0.357 5046	489
24	0.460 4490	0.452 9126	1456	0.827 7546	0.831 3419	601	0.359 0866	0.360 6430	482
25	0.445 3437	0.437 7426	1476	0.834 8702	0.838 3392	582	0.362 1738	0.363 6788	474
26	0.430 1100	0.422 4464	1495	0.841 7486	0.845 0981	562	0.365 1580	0.366 6111	466
27	+0.414 7524	+0.407 0285	+1515	+0.848 3875	+0.851 6165	−542	+0.368 0381	+0.369 4389	−458
28	0.399 2753	0.391 4934	1534	0.854 7848	0.857 8923	521	0.370 8133	0.372 1613	450
29	0.383 6834	0.375 8458	1553	0.860 9387	0.863 9238	500	0.373 4828	0.374 7776	442
30	0.367 9813	0.360 0905	1572	0.866 8473	0.869 7091	479	0.376 0456	0.377 2868	433
31	0.352 1739	0.344 2322	1590	0.872 5088	0.875 2464	458	0.378 5012	0.379 6884	424
June 1	+0.336 2660	+0.328 2759	+1608	+0.877 9216	+0.880 5342	−436	+0.380 8487	+0.381 9817	−415
2	0.320 2625	0.312 2264	1626	0.883 0840	0.885 5709	414	0.383 0875	0.384 1660	406
3	0.304 1682	0.296 0885	1643	0.887 9948	0.890 3554	391	0.385 2171	0.386 2408	396
4	0.287 9880	0.279 8672	1660	0.892 6527	0.894 8864	368	0 387 2370	0.388 2056	387
5	0.271 7268	0.263 5674	1677	0.897 0565	0.899 1628	345	0.389 1466	0.390 0600	377
6	+0.255 3895	+0.247 1939	+1693	+0.901 2052	+0.903 1836	−321	+0.390 9456	+0.391 8035	−366
7	0.238 9810	0.230 7516	1709	0.905 0980	0.906 9481	297	0.392 6336	0.393 4359	356
8	0.222 5062	0.214 2454	1725	0.908 7339	0.910 4554	272	0.394 2103	0.394 9568	346
9	0.205 9700	0.197 6803	1740	0.912 1124	0.913 7048	247	0.395 6754	0.396 3660	335
10	0.189 3771	0.181 0610	1755	0.915 2327	0.916 6959	222	0.397 0286	0.397 6632	324
11	+0.172 7324	+0.164 3921	+1769	+0.918 0945	+0.919 4283	−197	+0.398 2699	+0.398 8484	−313
12	0.156 0405	0.147 6782	1783	0.920 6974	0.921 9017	171	0.399 3990	0.399 9214	302
13	0.139 3059	0.130 9240	1796	0.923 0411	0.924 1157	145	0.400 4158	0.400 8821	290
14	0.122 5332	0.114 1339	1809	0.925 1254	0.926 0702	119	0.401 3203	0.401 7303	279
15	0.105 7268	0.097 3123	1822	0.926 9499	0.927 7647	92	0.402 1122	0.402 4659	267
16	+0.088 8909	+0.080 4633	+1834	+0.928 5145	+0.929 1991	− 65	+0.402 7915	+0.403 0888	−255
17	0.072 0299	0.063 5912	1846	0.929 8186	0.930 3730	37	0.403 3579	0.403 5987	243
18	0.055 1479	0.046 7004	1857	0.930 8621	0.931 2860	− 10	0.403 8113	0.403 9955	231
19	0.038 2492	0.029 7951	1867	0.931 6445	0.931 9376	+ 18	0.404 1513	0.404 2788	219
20	0.021 3385	+0.012 8800	1878	0.932 1653	0.932 3274	46	0.404 3779	0.404 4485	206
21	+0.004 4202	−0.004 0403	+1888	+0.932 4241	+0.932 4551	+ 75	+0.404 4907	+0.404 5044	−193
22	−0.012 5010	0.020 9612	1897	0.932 4206	0.932 3203	104	0.404 4895	0.404 4462	180
23	0.029 4203	0.037 8778	1905	0.932 1543	0.931 9225	133	0.404 3743	0.404 2738	167
24	0.046 3330	0.054 7853	1913	0.931 6250	0.931 2618	162	0.404 1448	0.403 9872	154
25	0.063 2341	0.071 6787	1921	0.930 8328	0.930 3380	191	0.403 8011	0.403 5864	141
26	−0.080 1185	−0.088 5529	+1928	+0.929 7775	+0.929 1513	+221	+0.403 3432	+0.403 0713	−127
27	0.096 9812	0.105 4030	1934	0.928 4593	0.927 7017	251	0.402 7710	0.402 4421	114
28	0.113 8174	0.122 2240	1939	0.926 8785	0.925 9897	281	0.402 0848	0.401 6989	100
29	0.130 6220	0.139 0108	1944	0.925 0354	0.924 0157	312	0.401 2846	0.400 8419	86
30	0.147 3898	0.155 7584	1948	0.922 9305	0.921 7801	343	0.400 3709	0.399 8715	72
ly 1	−0.164 1159	−0.172 4617	+1952	+0.920 5645	+0.919 2838	+374	+0.399 3438	+0.398 7878	− 58
2	−0.180 7952	−0.189 1158	+1956	+0.917 9381	+0.916 5275	+405	+0.398 2037	+0.397 5914	− 44

GREENWICH MEAN TIME.

Date.	X True Equinox.		Reduc. to Mean Eq'x of 1916.0	Y True Equinox.		Reduc. to Mean Eq'x of 1916.0	Z True Equinox.		Reduc. to Mean Eq'x of 1916.0
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
July 1	−0.164 1159	−0.172 4617	+1952	+0.920 5645	+0.919 2838	+ 374	+0.399 3438	+0.398 7878	− 58
2	0.180 7952	0.189 1158	1956	0.917 9381	0.916 5275	405	0.398 2037	0.397 5914	44
3	0.197 4229	0.205 7158	1959	0.915 0521	0.913 5120	436	0.396 9510	0.396 2826	30
4	0.213 9939	0.222 2567	1961	0.911 9075	0.910 2385	467	0.395 5862	0.394 8619	15
5	0.230 5035	0.238 7337	1962	0.908 5053	0.906 7081	498	0.394 1098	0.393 3298	− 1
6	−0.246 9467	−0.255 1419	+1963	+0.904 8469	+0.902 9219	+ 530	+0.392 5222	+0.391 6870	+ 13
7	0.263 3188	0.271 4768	1963	0.900 9333	0.898 8813	562	0.390 8242	0.389 9339	28
8	0.279 6152	0.287 7336	1962	0.896 7661	0.894 5879	593	0.389 0163	0.388 0713	43
9	0.295 8314	0.303 9079	1961	0.892 3468	0.890 0430	625	0.387 0991	0.386 0998	57
10	0.311 9628	0.319 9953	1959	0.887 6769	0.885 2485	657	0.385 0734	0.384 0201	72
11	−0.328 0050	−0.335 9913	+1956	+0.882 7580	+0.880 2057	+ 689	+0.382 9400	+0.381 8330	+ 87
12	0.343 9538	0.351 8919	1953	0.877 5918	0.874 9164	721	0.380 6993	0.379 5391	102
13	0.359 8051	0.367 6930	1949	0.872 1798	0.869 3822	753	0.378 3523	0.377 1390	117
14	0.375 5550	0.383 3906	1944	0.866 5238	0.863 6048	785	0.375 8994	0.374 6335	132
15	0.391 1994	0.398 9809	1939	0.860 6254	0.857 5857	818	0.373 3414	0.372 0231	147
16	−0.406 7344	−0.414 4596	+1934	+0.854 4859	+0.851 3262	+ 850	+0.370 6788	+0.369 3085	+163
17	0.422 1560	0.429 8229	1927	0.848 1068	0.844 8279	882	0.367 9123	0.366 4902	178
18	0.437 4600	0.445 0666	1919	0.841 4896	0.838 0921	914	0.365 0424	0.363 5689	193
19	0.452 6424	0.460 1866	1911	0.834 6356	0.831 1204	946	0.362 0697	0.360 5450	208
20	0.467 6989	0.475 1786	1902	0.827 5464	0.823 9141	978	0.358 9949	0.357 4193	223
21	−0.482 6252	−0.490 0382	+1892	+0.820 2236	+0.816 4752	+1010	+0.355 8185	+0.354 1924	+239
22	0.497 4169	0.504 7608	1882	0.812 6689	0.808 8051	1041	0.352 5413	0.350 8651	254
23	0.512 0694	0.519 3421	1871	0.804 8840	0.800 9058	1073	0.349 1641	0.347 4383	270
24	0.526 5784	0.533 7777	1859	0.796 8709	0.792 7793	1105	0.345 6878	0.343 9127	285
25	0.540 9394	0.548 0631	1847	0.788 6316	0.784 4277	1137	0.342 1131	0.340 2893	300
26	−0.555 1481	−0.562 1939	+1834	+0.780 1682	+0.775 8532	+1168	+0.338 4412	+0.336 5691	+316
27	0.569 2000	0.576 1658	1820	0.771 4831	0.767 0582	1199	0.334 6731	0.332 7532	331
28	0.583 0909	0.589 9746	1805	0.762 5787	0.758 0450	1230	0.330 8097	0.328 8426	346
29	0.596 8165	0.603 6161	1790	0.753 4574	0.748 8163	1261	0.326 8522	0.324 8385	361
30	0.610 3727	0.617 0859	1774	0.744 1219	0.739 3746	1292	0.322 8017	0.320 7420	376
31	−0.623 7552	−0.630 3801	+1757	+0.734 5748	+0.729 7228	+1322	+0.318 6596	+0.316 5545	+392
Aug. 1	0.636 9600	0.643 4945	1739	0.724 8190	0.719 8637	1352	0.314 4269	0.312 2770	407
2	0.649 9830	0.656 4252	1721	0.714 8573	0.709 8003	1382	0.310 1051	0.307 9111	422
3	0.662 8204	0.669 1683	1702	0.704 6929	0.699 5356	1412	0.305 6954	0.303 4580	437
4	0.675 4685	0.681 7203	1682	0.694 3287	0.689 0727	1441	0.301 1992	0.298 9190	452
5	−0.687 9235	−0.694 0775	+1662	+0.683 7679	+0.678 4148	+1470	+0.296 6178	+0.294 2957	+467
6	0.700 1819	0.706 2364	1641	0.673 0138	0.667 5653	1499	0.291 9528	0.289 5894	482
7	0.712 2403	0.718 1935	1620	0.662 0697	0.656 5274	1527	0.287 2055	0.284 8015	496
8	0.724 0955	0.729 9459	1598	0.650 9388	0.645 3044	1556	0.282 3774	0.279 9334	511
9	0.735 7443	0.741 4904	1575	0.639 6245	0.633 8996	1584	0.277 4698	0.274 9867	525
10	−0.747 1837	−0.752 8240	+1551	+0.628 1300	+0.622 3162	+1611	+0.272 4842	+0.269 9625	+540
11	0.758 4110	0.763 9441	1527	0.616 4586	0.610 5576	1638	0.267 4219	0.264 8624	554
12	0.769 4231	0.774 8476	1502	0.604 6135	0.598 6267	1665	0.262 2842	0.259 6875	568
13	0.780 2174	0.785 5319	1477	0.592 5976	0.586 5267	1691	0.257 0724	0.254 4392	583
14	0.790 7908	0.795 9939	1450	0.580 4142	0.574 2605	1717	0.251 7879	0.249 1187	597
15	−0.801 1406	−0.806 2307	+1423	+0.568 0661	+0.561 8312	+1742	+0.246 4318	+0.243 7274	+611
16	−0.811 2638	−0.816 2394	+1396	+0.555 5564	+0.549 2419	+1767	+0.241 0056	+0.238 2665	+625

GREENWICH MEAN TIME.

Date.	X True Equinox.		Reduc. to Mean Eq'x of 1916.0	Y True Equinox.		Reduc. to Mean Eq'x of 1916.0	Z True Equinox.		Reduc. to Mean Eq'x of 1916.0
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
Aug. 16	−0.811 2638	−0.816 2394	+1396	+0.555 5564	+0.549 2419	+1767	+0.241 0056	+0.238 2665	+ 625
17	0.821 1573	0.826 0170	1368	0.542 8882	0.536 4957	1792	0.235 5104	0.232 7374	638
18	0.830 8181	0.835 5603	1339	0.530 0647	0.523 5957	1816	0.229 9476	0.227 1413	652
19	0.840 2431	0.844 8663	1310	0.517 0891	0.510 5453	1840	0.224 3187	0.221 4799	665
20	0.849 4293	0.853 9318	1280	0.503 9648	0.497 3479	1863	0.218 6251	0.215 7546	678
21	−0.858 3734	−0.862 7538	+1249	+0.490 6953	+0.484 0072	+1886	+0.212 8684	+0.209 9669	+ 691
22	0.867 0726	0.871 3294	1218	0.477 2841	0.470 5266	1908	0.207 0502	0.204 1185	704
23	0.875 5238	0.879 6555	1187	0.463 7351	0.456 9100	1930	0.201 1720	0.198 2110	717
24	0.883 7242	0.887 7294	1155	0.450 0519	0.443 1612	1951	0.195 2356	0.192 2460	730
25	0.891 6709	0.895 5482	1122	0.436 2384	0.429 2841	1972	0.189 2426	0.186 2255	742
26	−0.899 3612	−0.903 1094	+1089	+0.422 2986	+0.415 2826	+1992	+0.183 1948	+0.180 1510	+ 754
27	0.906 7925	0.910 4103	1055	0.408 2366	0.401 1610	2012	0.177 0940	0.174 0243	766
28	0.913 9623	0.917 4484	1021	0.394 0564	0.386 9234	2031	0.170 9421	0.167 8474	778
29	0.920 8682	0.924 2214	986	0.379 7624	0.372 5739	2049	0.164 7407	0.161 6221	790
30	0.927 5078	0.930 7270	951	0.365 3587	0.358 1171	2067	0.158 4919	0.155 3503	802
31	−0.933 8789	−0.936 9632	+ 916	+0.350 8498	+0.343 5572	+2084	+0.152 1976	+0.149 0340	+ 813
Sept. 1	0.939 9796	0.942 9279	880	0.336 2400	0.328 8987	2101	0.145 8597	0.142 6751	824
2	0.945 8079	0.948 6193	843	0.321 5338	0.314 1460	2117	0.139 4802	0.136 2755	835
3	0.951 3620	0.954 0358	806	0.306 7359	0.299 3038	2133	0.133 0610	0.129 8372	846
4	0.956 6406	0.959 1760	769	0.291 8505	0.284 3764	2148	0.126 6041	0.123 3621	856
5	−0.961 6421	−0.964 0385	+ 731	+0.276 8822	+0.269 3684	+2162	+0.120 1113	+0.116 8521	+ 866
6	0.966 3653	0.968 6221	693	0.261 8354	0.254 2839	2176	0.113 5846	0.110 3091	876
7	0.970 8090	0.972 9256	654	0.246 7144	0.239 1275	2189	0.107 0257	0.103 7348	885
8	0.974 9721	0.976 9481	615	0.231 5236	0.223 9033	2201	0.100 4366	0.097 1312	895
9	0.978 8536	0.980 6885	576	0.216 2672	0.208 6156	2213	0.093 8190	0.090 5000	904
10	−0.982 4526	−0.984 1459	+ 536	+0.200 9493	+0.193 2685	+2224	+0.087 1746	+0.083 8430	+ 913
11	0.985 7681	0.987 3193	496	0.185 5740	0.177 8660	2235	0.080 5053	0.077 1618	922
12	0.988 7991	0.990 2076	456	0.170 1453	0.162 4122	2245	0.073 8127	0.070 4582	930
13	0.991 5445	0.992 8098	415	0.154 6672	0.146 9110	2254	0.067 0986	0.063 7340	938
14	0.994 0032	0.995 1247	374	0.139 1440	0.131 3667	2263	0.060 3647	0.056 9908	946
15	−0.996 1741	−0.997 1513	+ 333	+0.123 5797	+0.115 7834	+2271	+0.053 6128	+0.050 2306	+ 954
16	0.998 0561	0.998 8884	292	0.107 9784	0.100 1653	2278	0.046 8447	0.043 4552	961
17	0.999 6481	1.000 3350	250	0.092 3445	0.084 5167	2285	0.040 0624	0.036 6664	968
18	1.000 9490	1.001 4900	208	0.076 6824	0.068 8421	2291	0.033 2677	0.029 8663	975
19	1.001 9580	1.002 3527	166	0.060 9965	0.053 1461	2296	0.026 4626	0.023 0567	982
20	−1.002 6741	−1.002 9222	+ 123	+0.045 2915	+0.037 4332	+2300	+0.019 6490	+0.016 2398	+ 988
21	1.003 0967	1.003 1977	81	0.029 5719	0.021 7081	2304	0.012 8292	0.009 4175	994
22	1.003 2251	1.003 1788	+ 38	+0.013 8424	+0.005 9754	2308	+0.006 0050	+0.002 5920	999
23	1.003 0587	1.002 8647	− 5	−0.001 8922	−0.009 7600	2311	−0.000 8213	−0.004 2347	1005
24	1.002 5970	1.002 2553	48	0.017 6273	0.025 4934	2313	0.007 6478	0.011 0605	1010
25	−1.001 8398	−1.001 3503	− 92	−0.033 3579	−0.041 2200	+2314	−0.014 4723	−0.017 8832	+1014
26	1.000 7870	1.000 1496	135	0.049 0792	0.056 9349	2315	0.021 2927	0.024 7007	1018
27	0.999 4384	0.998 6532	179	0.064 7863	0.072 6330	2315	0.028 1068	0.031 5108	1022
28	0.997 7942	0.996 8612	222	0.080 4742	0.088 3095	2314	0.034 9124	0.038 3114	1026
29	0.995 8545	0.994 7741	266	0.096 1381	0.103 9594	2312	0.041 7074	0.045 1003	1030
30	−0.993 6200	−0.992 3924	− 310	−0.111 7729	−0.119 5778	+2310	−0.048 4897	−0.051 8753	+1033
ct. 1	−0.991 0913	−0.989 7168	− 354	−0.127 3736	−0.135 1597	+2307	−0.055 2570	−0.058 6344	+1036

GREENWICH MEAN TIME.

Date.	X True Equinox.		Reduc. to Mean Eq'x of 1916.0	Y True Equinox.		Reduc. to Mean Eq'x of 1916.0	Z True Equinox.		Reduc. to Mean Eq'x of 1916.0
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
Oct. 1	−0.991 0913	−0.989 7168	− 354	−0.127 3736	−0.135 1597	+2307	−0.055 2570	−0.058 6344	+1036
2	0.988 2691	0.986 7483	398	0.142 9354	0.150 7002	2303	0.062 0073	0.065 3754	1038
3	0.985 1544	0.983 4877	442	0.158 4535	0.166 1947	2299	0.068 7385	0.072 0964	1040
4	0.981 7482	0.979 9362	486	0.173 9231	0.181 6384	2294	0.075 4486	0.078 7952	1042
5	0.978 0518	0.976 0951	531	0.189 3398	0.197 0268	2289	0.082 1357	0.085 4699	1043
6	−0.974 0663	−0.971 9655	− 575	−0.204 6989	−0.212 3555	+2282	−0.088 7977	−0.092 1188	+1044
7	0.969 7930	0.967 5489	619	0.219 9960	0.227 6200	2275	0.095 4330	0.098 7400	1045
8	0.965 2334	0.962 8466	663	0.235 2268	0.242 8161	2268	0.102 0396	0.105 3316	1046
9	0.960 3887	0.957 8599	708	0.250 3872	0.257 9396	2260	0.108 6158	0.111 8918	1046
10	0.955 2603	0.952 5900	752	0.265 4728	0.272 9862	2251	0.115 1596	0.118 4188	1045
11	−0.949 8493	−0.947 0382	− 796	−0.280 4795	−0.287 9519	+2241	−0.121 6693	−0.124 9108	+1044
12	0.944 1570	0.941 2057	840	0.295 4031	0.302 8324	2231	0.128 1432	0.131 3661	1043
13	0.938 1845	0.935 0937	884	0.310 2394	0.317 6236	2220	0.134 5794	0.137 7828	1042
14	0.931 9333	0.928 7035	928	0.324 9844	0.332 3212	2209	0.140 9761	0.144 1590	1040
15	0.925 4046	0.922 0366	971	0.339 6335	0.346 9208	2197	0.147 3313	0.150 4927	1038
16	−0.918 5997	−0.915 0942	−1015	−0.354 1824	−0.361 4180	+2184	−0.153 6431	−0.156 7822	+1036
17	0.911 5202	0.907 8779	1059	0.368 6268	0.375 8084	2170	0.159 9096	0.163 0253	1033
18	0.904 1676	0.900 3895	1103	0.382 9622	0.390 0876	2156	0.166 1289	0.169 2202	1030
19	0.896 5437	0.892 6306	1146	0.397 1841	0.404 2511	2141	0.172 2990	0.175 3650	1026
20	0.888 6502	0.884 6030	1189	0.411 2881	0.418 2944	2126	0.178 4179	0.181 4575	1022
21	−0.880 4890	−0.876 3087	−1232	−0.425 2696	−0.432 2130	+2110	−0.184 4836	−0.187 4960	+1018
22	0.872 0621	0.867 7497	1275	0.439 1242	0.446 0025	2093	0.190 4942	0.193 4782	1013
23	0.863 3717	0.858 9284	1318	0.452 8474	0.459 6583	2075	0.196 4477	0.199 4024	1008
24	0.854 4200	0.849 8470	1360	0.466 4347	0.473 1760	2057	0.202 3421	0.205 2666	1003
25	0.845 2095	0.840 5080	1403	0.479 8817	0.486 5511	2038	0.208 1755	0.211 0687	997
26	−0.835 7427	−0.830 9140	−1445	−0.493 1837	−0.499 7790	+2018	−0.213 9458	−0.216 8068	+ 991
27	0.826 0223	0.821 0680	1487	0.506 3364	0.512 8553	1998	0.219 6513	0.222 4790	985
28	0.816 0514	0.810 9729	1529	0.519 3352	0.525 7755	1977	0.225 2898	0.228 0833	978
29	0.805 8330	0.800 6320	1570	0.532 1758	0.538 5355	1956	0.230 8595	0.233 6180	971
30	0.795 3704	0.790 0486	1611	0.544 8542	0.551 1312	1934	0.236 3587	0.239 0813	964
31	−0.784 6670	−0.779 2261	−1652	−0.557 3661	−0.563 5584	+1911	−0.241 7856	−0.244 4715	+ 956
Nov. 1	0.773 7262	0.768 1680	1693	0.569 7077	0.575 8134	1888	0.247 1386	0.249 7869	948
2	0.762 5517	0.756 8779	1733	0.581 8751	0.587 8924	1864	0.252 4161	0.255 0260	939
3	0.751 1470	0.745 3594	1773	0.593 8647	0.599 7918	1839	0.257 6164	0.260 1872	930
4	0.739 5156	0.733 6160	1813	0.605 6731	0.611 5082	1814	0.262 7382	0.265 2692	921
5	−0.727 6611	−0.721 6513	−1852	−0.617 2967	−0.623 0383	+1788	−0.267 7800	−0.270 2704	+ 911
6	0.715 5870	0.709 4688	1891	0.628 7324	0.634 3787	1762	0.272 7403	0.275 1895	901
7	0.703 2970	0.697 0720	1930	0.639 9768	0.645 5262	1735	0.277 6178	0.280 0251	891
8	0.690 7944	0.684 4646	1968	0.651 0267	0.656 4777	1707	0.282 4111	0.284 7757	880
9	0.678 0830	0.671 6500	2006	0.661 8789	0.667 2300	1679	0.287 1188	0.289 4402	869
10	−0.665 1660	−0.658 6316	−2044	−0.672 5304	−0.677 7798	+1650	−0.291 7396	−0.294 0169	+ 857
11	0.652 0471	0.645 4130	2081	0.682 9778	0.688 1240	1620	0.296 2719	0.298 5045	845
12	0.638 7296	0.631 9976	2118	0.693 2180	0.698 2593	1590	0.300 7145	0.302 9017	833
13	0.625 2172	0.618 3891	2154	0.703 2477	0.708 1826	1559	0.305 0659	0.307 2069	821
14	0.611 5136	0.604 5913	2190	0.713 0638	0.717 8907	1528	0.309 3246	0.311 4188	808
15	−0.597 6225	−0.590 6079	−2226	−0.722 6630	−0.727 3804	+1496	−0.313 4893	−0.315 5359	+ 795
16	−0.583 5478	−0.576 4428	−2261	−0.732 0423	−0.736 6484	+1463	−0.317 5585	−0.319 5568	+ 782

GREENWICH MEAN TIME.

Date.	X True Equinox.		Reduc. to Mean Eq'x of 1916.0	Y True Equinox.		Reduc. to Mean Eq'x of 1916.0	Z True Equinox.		Reduc. to Mean Eq'x of 1916.0
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
Nov.16	−0.583 5478	−0.576 4428	−2261	−0.732 0423	−0.736 6484	+1463	−0.317 5585	−0.319 5568	+782
17	0.569 2933	0.562 1000	2295	0.741 1984	0.745 6918	1430	0.321 5308	0.323 4803	768
18	0.554 8632	0.547 5835	2329	0.750 1282	0.754 5073	1396	0.325 4050	0.327 3048	754
19	0.540 2616	0.532 8978	2362	0.758 8287	0.763 0920	1361	0.329 1796	0.331 0291	739
20	0.525 4927	0.518 0469	2395	0.767 2967	0.771 4426	1326	0.332 8532	0.334 6517	725
21	−0.510 5610	−0.503 0354	−2427	−0.775 5293	−0.779 5563	+1291	−0.336 4245	−0.338 1714	+710
22	0.495 4707	0.487 8676	2460	0.783 5234	0.787 4300	1255	0.339 8922	0.341 5868	695
23	0.480 2266	0.472 5483	2491	0.791 2760	0.795 0609	1218	0.343 2550	0.344 8967	679
24	0.464 8334	0.457 0824	2522	0.798 7844	0.802 4462	1180	0.346 5117	0.348 0999	663
25	0.449 2960	0.441 4749	2552	0.806 0458	0.809 5830	1142	0.349 6611	0.351 1952	647
26	−0.433 6196	−0.425 7308	−2582	−0.813 0575	−0.816 4690	+1104	−0.352 7021	−0.354 1816	+631
27	0.417 8091	0.409 8553	2611	0.819 8172	0.823 1017	1065	0.355 6336	0.357 0580	614
28	0.401 8700	0.393 8539	2639	0.826 3224	0.829 4790	1025	0.358 4547	0.359 8236	597
29	0.385 8076	0.377 7318	2667	0.832 5712	0.835 5989	985	0.361 1646	0.362 4776	579
30	0.369 6270	0.361 4942	2694	0.838 5617	0.841 4596	944	0.363 7624	0.365 0192	561
Dec. 1	−0.353 3337	−0.345 1463	−2720	−0.844 2922	−0.847 0594	+ 903	−0.366 2476	−0.367 4477	+543
2	0.336 9327	0.328 6934	2745	0.849 7611	0.852 3969	861	0.368 6194	0.369 7626	525
3	0.320 4292	0.312 1406	2770	0.854 9668	0.857 4706	819	0.370 8772	0.371 9632	507
4	0.303 8283	0.295 4930	2795	0.859 9081	0.862 2792	776	0.373 0204	0.374 0489	488
5	0.287 1352	0.278 7555	2819	0.864 5837	0.866 8214	733	0.375 0485	0.376 0192	469
6	−0.270 3546	−0.261 9330	−2842	−0.868 9923	−0.871 0961	+ 689	−0.376 9609	−0.377 8736	+450
7	0.253 4915	0.245 0306	2864	0.873 1327	0.875 1020	645	0.378 7572	0.379 6116	431
8	0.236 5510	0.228 0532	2885	0.877 0038	0.878 8380	600	0.380 4367	0.381 2326	411
9	0.219 5379	0.211 0056	2906	0.880 6044	0.882 3029	555	0.381 9990	0.382 7361	391
10	0.202 4570	0.193 8928	2926	0.883 9334	0.885 4956	509	0.383 4436	0.384 1216	371
11	−0.185 3135	−0.176 7197	−2945	−0.886 9896	−0.888 4152	+ 463	−0.384 7699	−0.385 3886	+351
12	0.168 1121	0.159 4913	2963	0.889 7721	0.891 0603	417	0.385 9775	0.386 5366	330
13	0.150 8580	0.142 2128	2980	0.892 2797	0.893 4301	370	0.387 0659	0.387 5652	310
14	0.133 5562	0.124 8891	2996	0.894 5115	0.895 5237	322	0.388 0346	0.388 4739	289
15	0.116 2120	0.107 5255	3012	0.896 4666	0.897 3400	274	0.388 8832	0.389 2623	268
16	−0.098 8303	−0.090 1271	−3027	−0.898 1440	−0.898 8783	+ 226	−0.389 6112	−0.389 9299	+246
17	0.081 4165	0.072 6993	3040	0.899 5429	0.900 1377	178	0.390 2183	0.390 4764	225
18	0.063 9760	0.055 2474	3053	0.900 6625	0.901 1174	129	0.390 7041	0.390 9014	203
19	0.046 5141	0.037 7767	3065	0.901 5022	0.901 8169	80	0.391 0684	0.391 2048	181
20	0.029 0361	0.020 2928	3077	0.902 0613	0.902 2355	+ 30	0.391 3108	0.391 3862	159
21	−0.011 5476	−0.002 8013	−3087	−0.902 3393	−0.902 3727	− 20	−0.391 4311	−0.391 4454	+137
22	+0.005 9456	+0.014 6923	3096	0.902 3356	0.902 2280	70	0.391 4290	0.391 3820	115
23	0.023 4380	0.032 1820	3104	0.902 0499	0.901 8013	121	0.391 3044	0.391 1962	93
24	0.040 9235	0.049 6619	3111	0.901 4821	0.901 0924	172	0.391 0574	0.390 8880	70
25	0.058 3964	0.067 1262	3117	0.900 6322	0.900 1016	223	0.390 6880	0.390 4574	48
26	+0.075 8507	+0.084 5690	−3122	−0.899 5005	−0.898 8291	− 274	−0.390 1963	−0.389 9047	+ 25
27	0.093 2805	0.101 9845	3126	0.898 0874	0.897 2755	326	0.389 5826	0.389 2300	+ 2
28	0.110 6802	0.119 3669	3129	0.896 3936	0.895 4416	377	0.388 8471	0.388 4338	− 21
29	0.128 0439	0.136 7104	3131	0.894 4197	0.893 3281	429	0.387 9903	0.387 5165	44
30	0.145 3659	0.154 0097	3132	0.892 1669	0.890 9362	481	0.387 0126	0.386 4786	67
31	+0.162 6410	+0.171 2593	−3132	−0.889 6362	−0.888 2671	− 533	−0.385 9145	−0.385 3205	− 90
32	+0.179 8638	+0.188 4540	−3132	−0.886 8289	−0.885 3218	− 586	−0.384 6965	−0.384 0428	−114

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JANUARY 1.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	h m s	s	° ′ ″	″
0	14 55 33.31	2.5091	−22 7 2.7	−9.914
1	14 58 4.12	2.5179	22 16 53.6	9.782
2	15 0 35.46	2.5268	22 26 36.5	9.646
3	15 3 7.33	2.5355	22 36 11.1	9.508
4	15 5 39.72	2.5442	22 45 37.4	9.368
5	15 8 12.63	2.5529	22 54 55.3	9.228
6	15 10 46.07	2.5617	23 4 4.7	9.084
7	15 13 20.03	2.5703	23 13 5.4	8.938
8	15 15 54.50	2.5788	23 21 57.2	8.789
9	15 18 29.49	2.5874	23 30 40.1	8.640
10	15 21 4.99	2.5958	23 39 14.0	8.488
11	15 23 40.99	2.6043	23 47 38.7	8.334
12	15 26 17.50	2.6127	23 55 54.1	8.178
13	15 28 54.51	2.6209	24 4 0.0	8.019
14	15 31 32.01	2.6291	24 11 56.4	7.860
15	15 34 10.00	2.6373	24 19 43.2	7.698
16	15 36 48.48	2.6453	24 27 20.2	7.533
17	15 39 27.43	2.6532	24 34 47.2	7.367
18	15 42 6.86	2.6610	24 42 4.2	7.199
19	15 44 46.75	2.6688	24 49 11.1	7.030
20	15 47 27.11	2.6764	24 56 7.8	6.858
21	15 50 7.92	2.6839	25 2 54.1	6.684
22	15 52 49.18	2.6913	25 9 29.9	6.508
23	15 55 30.87	2.6985	−25 15 55.1	−6.332

JANUARY 2.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	h m s	s	° ′ ″	″
0	15 58 13.00	2.7058	−25 22 9.7	−6.153
1	16 0 55.56	2.7128	25 28 13.5	5.972
2	16 3 38.53	2.7196	25 34 6.3	5.788
3	16 6 21.91	2.7263	25 39 48.1	5.604
4	16 9 5.69	2.7330	25 45 18.8	5.418
5	16 11 49.87	2.7395	25 50 38.3	5.231
6	16 14 34.43	2.7458	25 55 46.5	5.042
7	16 17 19.36	2.7518	26 0 43.3	4.851
8	16 20 4.65	2.7578	26 5 28.6	4.668
9	16 22 50.29	2.7636	26 10 2.3	4.465
10	16 25 36.28	2.7693	26 14 24.4	4.270
11	16 28 22.60	2.7747	26 18 34.7	4.073
12	16 31 9.24	2.7800	26 22 33.2	3.875
13	16 33 56.20	2.7851	26 26 19.7	3.676
14	16 36 43.45	2.7899	26 29 54.3	3.476
15	16 39 30.99	2.7947	26 33 16.8	3.273
16	16 42 18.81	2.7992	26 36 27.1	3.070
17	16 45 6.89	2.8034	26 39 25.2	2.866
18	16 47 55.22	2.8075	26 42 11.0	2.661
19	16 50 43.79	2.8114	26 44 44.5	2.456
20	16 53 32.59	2.8151	26 47 5.7	2.249
21	16 56 21.60	2.8186	26 49 14.4	2.041
22	16 59 10.82	2.8218	26 51 10.6	1.833
23	17 2 0.22	2.8248	26 52 54.3	1.623
24	*17 4 49.80*	*2.8278*	*−26 54 25.3*	*−1.412*

JANUARY 3.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	h m s	s	° ′ ″	″
0	17 4 49.80	2.8278	−26 54 25.3	−1.412
1	17 7 39.55	2.8303	26 55 43.7	1.201
2	17 10 29.44	2.8326	26 56 49.4	0.989
3	17 13 19.46	2.8348	26 57 42.4	0.777
4	17 16 9.61	2.8367	26 58 22.6	0.564
5	17 18 59.86	2.8383	26 58 50.1	0.352
6	17 21 50.21	2.8398	26 59 4.8	−0.138
7	17 24 40.63	2.8409	26 59 6.7	+0.075
8	17 27 31.12	2.8419	26 58 55.8	0.289
9	17 30 21.66	2.8427	26 58 32.0	0.503
10	17 33 12.24	2.8433	26 57 55.4	0.718
11	17 36 2.85	2.8435	26 57 5.9	0.932
12	17 38 53.46	2.8435	26 56 3.6	1.146
13	17 41 44.07	2.8433	26 54 48.4	1.361
14	17 44 34.66	2.8428	26 53 20.3	1.575
15	17 47 25.21	2.8422	26 51 39.4	1.788
16	17 50 15.72	2.8413	26 49 45.7	2.002
17	17 53 6.17	2.8402	26 47 39.2	2.216
18	17 55 56.54	2.8388	26 45 19.8	2.429
19	17 58 46.82	2.8372	26 42 47.7	2.641
20	18 1 37.00	2.8354	26 40 2.9	2.853
21	18 4 27.07	2.8333	26 37 5.4	3.063
22	18 7 17.00	2.8310	26 33 55.3	3.274
23	18 10 6.79	2.8286	−26 30 32.5	+3.485

JANUARY 4.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	h m s	s	° ′ ″	″
0	18 12 56.43	2.8259	−26 26 57.1	+3.694
1	18 15 45.90	2.8229	26 23 9.2	3.903
2	18 18 35.18	2.8197	26 19 8.8	4.110
3	18 21 24.26	2.8163	26 14 56.0	4.317
4	18 24 13.14	2.8128	26 10 30.8	4.523
5	18 27 1.80	2.8090	26 5 53.3	4.728
6	18 29 50.22	2.8050	26 1 3.5	4.931
7	18 32 38.40	2.8008	25 56 1.6	5.133
8	18 35 26.32	2.7965	25 50 47.6	5.334
9	18 38 13.98	2.7920	25 45 21.5	5.534
10	18 41 1.36	2.7872	25 39 43.5	5.733
11	18 43 48.44	2.7822	25 33 53.6	5.930
12	18 46 35.22	2.7771	25 27 51.9	6.126
13	18 49 21.69	2.7718	25 21 38.5	6.320
14	18 52 7.83	2.7063	25 15 13.5	6.513
15	18 54 53.64	2.7607	25 8 37.0	6.703
16	18 57 39.11	2.7549	25 1 49.1	6.893
17	19 0 24.23	2.7489	24 54 49.8	7.082
18	19 3 8.98	2.7428	24 47 39.3	7.268
19	19 5 53.36	2.7365	24 40 17.6	7.453
20	19 8 37.36	2.7301	24 32 44.9	7.635
21	19 11 20.97	2.7236	24 25 1.4	7.816
22	19 14 4.19	2.7169	24 17 7.0	7.996
23	19 16 47.00	2.7101	24 9 1.9	8.173
24	19 19 29.40	2.7031	−24 0 46.2	+8.348

GREENWICH MEAN TIME.

JANUARY 5.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	h m s	s	° ′ ″	″
0	19 19 29.40	2.7031	−24 0 46.2	+ 8.348
1	19 22 11.37	2.6960	23 52 20.1	8.522
2	19 24 52.92	2.6889	23 43 43.6	8.693
3	19 27 34.04	2.6817	23 34 56.9	8.863
4	19 30 14.72	2.6743	23 26 0.1	9.030
5	19 32 54.95	2.6668	23 16 53.3	9.195
6	19 35 34.73	2.6592	23 7 36.7	9.358
7	19 38 14.05	2.6515	22 58 10.3	9.520
8	19 40 52.91	2.6438	22 48 34.3	9.679
9	19 43 31.30	2.6358	22 38 48.8	9.836
10	19 46 9.21	2.6279	22 28 54.0	9.991
11	19 48 46.65	2.6200	22 18 49.9	10.143
12	19 51 23.61	2.6119	22 8 36.8	10.293
13	19 54 0.08	2.6038	21 58 14.7	10.442
14	19 56 36.06	2.5956	21 47 43.8	10.588
15	19 59 11.55	2.5874	21 37 4.2	10.732
16	20 1 46.55	2.5792	21 26 16.0	10.873
17	20 4 21.05	2.5708	21 15 19.4	11.013
18	20 6 55.05	2.5625	21 4 14.5	11.149
19	20 9 28.55	2.5541	20 53 1.5	11.284
20	20 12 1.54	2.5457	20 41 40.4	11.417
21	20 14 34.03	2.5373	20 30 11.5	11.546
22	20 17 6.01	2.5288	20 18 34.9	11.674
23	20 19 37.48	2.5203	−20 6 50.6	+11.800

JANUARY 6.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
0	20 22 8.44	2.5118	−19 54 58.9	+11.923
1	20 24 38.89	2.5033	19 42 59.8	12.044
2	20 27 8.83	2.4948	19 30 53.6	12.163
3	20 29 38.26	2.4863	19 18 40.3	12.279
4	20 32 7.18	2.4778	19 6 20.1	12.393
5	20 34 35.59	2.4693	18 53 53.2	12.504
6	20 37 3.49	2.4608	18 41 19.6	12.614
7	20 39 30.88	2.4523	18 28 39.5	12.721
8	20 41 57.76	2.4438	18 15 53.1	12.826
9	20 44 24.13	2.4353	18 3 0.4	12.929
10	20 46 50.00	2.4269	17 50 1.6	13.029
11	20 49 15.36	2.4184	17 36 56.9	13.127
12	20 51 40.21	2.4101	17 23 46.4	13.223
13	20 54 4.57	2.4018	17 10 30.2	13.317
14	20 56 28.42	2.3934	16 57 8.4	13.408
15	20 58 51.78	2.3852	16 43 41.2	13.497
16	21 1 14.64	2.3769	16 30 8.8	13.583
17	21 3 37.01	2.3688	16 16 31.3	13.668
18	21 5 58.89	2.3606	16 2 48.7	13.751
19	21 8 20.28	2.3525	15 49 1.2	13.831
20	21 10 41.19	2.3444	15 35 9.0	13.909
21	21 13 1.61	2.3364	15 21 12.1	13.985
22	21 15 21.56	2.3285	15 7 10.8	14.058
23	21 17 41.03	2.3206	14 53 5.1	14.131
24	*21 20 0.03*	*2.3128*	*−14 38 55.1*	*+14.201*

JANUARY 7.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	h m s	s	° ′ ″	″
0	21 20 0.03	2.3128	−14 38 55.1	+14.201
1	21 22 18.56	2.3050	14 24 41.0	14.268
2	21 24 36.63	2.2973	14 10 23.0	14.333
3	21 26 54.23	2.2896	13 56 1.1	14.397
4	21 29 11.38	2.2821	13 41 35.4	14.458
5	21 31 28.08	2.2746	13 27 6.1	14.518
6	21 33 44.33	2.2671	13 12 33.3	14.574
7	21 36 0.13	2.2597	12 57 57.2	14.629
8	21 38 15.49	2.2524	12 43 17.8	14.683
9	21 40 30.42	2.2452	12 28 35.2	14.735
10	21 42 44.91	2.2380	12 13 49.6	14.784
11	21 44 58.98	2.2309	11 59 1.1	14.832
12	21 47 12.62	2.2239	11 44 9.8	14.878
13	21 49 25.85	2.2170	11 29 15.8	14.922
14	21 51 38.66	2.2101	11 14 19.2	14.963
15	21 53 51.06	2.2033	10 59 20.2	15.003
16	21 56 3.06	2.1967	10 44 18.8	15.042
17	21 58 14.66	2.1901	10 29 15.2	15.078
18	22 0 25.87	2.1836	10 14 9.4	15.113
19	22 2 36.69	2.1771	9 59 1.6	15.146
20	22 4 47.12	2.1707	9 43 51.9	15.177
21	22 6 57.17	2.1644	9 28 40.4	15.207
22	22 9 6.85	2.1583	9 13 27.1	15.235
23	22 11 16.16	2.1522	− 8 58 12.2	+15.261

JANUARY 8.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
0	22 13 25.11	2.1462	− 8 42 55.8	+15.285
1	22 15 33.70	2.1403	8 27 38.0	15.308
2	22 17 41.94	2.1344	8 12 18.9	15.329
3	22 19 49.83	2.1286	7 56 58.5	15.349
4	22 21 57.37	2.1229	7 41 37.0	15.367
5	22 24 4.58	2.1174	7 26 14.5	15.383
6	22 26 11.46	2.1119	7 10 51.1	15.398
7	22 28 18.01	2.1065	6 55 26.8	15.411
8	22 30 24.24	2.1012	6 40 1.8	15.423
9	22 32 30.15	2.0959	6 24 36.1	15.433
10	22 34 35.75	2.0908	6 9 9.8	15.443
11	22 36 41.05	2.0858	5 53 43.0	15.449
12	22 38 46.05	2.0808	5 38 15.9	15.454
13	22 40 50.75	2.0760	5 22 48.5	15.459
14	22 42 55.17	2.0713	5 7 20.8	15.463
15	22 44 59.30	2.0666	4 51 53.0	15.464
16	22 47 3.16	2.0620	4 36 25.1	15.465
17	22 49 6.74	2.0575	4 20 57.2	15.463
18	22 51 10.06	2.0532	4 5 29.5	15.460
19	22 53 13.12	2.0488	3 50 2.0	15.457
20	22 55 15.92	2.0446	3 34 34.7	15.453
21	22 57 18.47	2.0404	3 19 7.7	15.446
22	22 59 20.77	2.0364	3 3 41.2	15.438
23	23 1 22.84	2.0325	2 48 15.2	15.429
24	23 3 24.67	2.0286	− 2 32 49.7	

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JANUARY 9.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	h m s	s	° ′ ″	″
0	23 3 24.67	2.0286	−2 32 49.7	+15.419
1	23 5 26.27	2.0248	2 17 24.9	15.408
2	23 7 27.65	2.0212	2 2 0.8	15.395
3	23 9 28.81	2.0176	1 46 37.5	15.381
4	23 11 29.76	2.0141	1 31 15.1	15.366
5	23 13 30.50	2.0107	1 15 53.6	15.350
6	23 15 31.04	2.0073	1 0 33.1	15.333
7	23 17 31.38	2.0041	0 45 13.7	15.314
8	23 19 31.53	2.0010	0 29 55.4	15.295
9	23 21 31.50	1.9979	−0 14 38.3	15.274
10	23 23 31.28	1.9949	+0 0 37.5	15.253
11	23 25 30.89	1.9921	0 15 52.0	15.229
12	23 27 30.33	1.9893	0 31 5.0	15.205
13	23 29 29.60	1.9866	0 46 16.6	15.181
14	23 31 28.72	1.9840	1 1 26.7	15.154
15	23 33 27.68	1.9814	1 16 35.1	15.127
16	23 35 26.49	1.9790	1 31 41.9	15.099
17	23 37 25.16	1.9767	1 46 47.0	15.070
18	23 39 23.69	1.9744	2 1 50.3	15.040
19	23 41 22.09	1.9722	2 16 51.8	15.009
20	23 43 20.35	1.9700	2 31 51.4	14.977
21	23 45 18.49	1.9681	2 46 49.0	14.943
22	23 47 16.52	1.9662	3 1 44.6	14.910
23	23 49 14.43	1.9643	+3 16 38.2	+14.875

JANUARY 10.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
0	23 51 12.23	1.9625	+3 31 29.6	+14.838
1	23 53 9.93	1.9608	3 46 18.8	14.802
2	23 55 7.53	1.9592	4 1 5.8	14.764
3	23 57 5.03	1.9577	4 15 50.5	14.726
4	23 59 2.45	1.9563	4 30 32.9	14.687
5	0 0 59.78	1.9548	4 45 12.9	14.646
6	0 2 57.03	1.9536	4 59 50.4	14.604
7	0 4 54.21	1.9524	5 14 25.4	14.563
8	0 6 51.32	1.9513	5 28 57.9	14.519
9	0 8 48.36	1.9502	5 43 27.7	14.475
10	0 10 45.34	1.9492	5 57 54.9	14.430
11	0 12 42.26	1.9483	6 12 19.3	14.384
12	0 14 39.14	1.9476	6 26 41.0	14.338
13	0 16 35.97	1.9468	6 40 59.9	14.291
14	0 18 32.75	1.9461	6 55 15.9	14.243
15	0 20 29.50	1.9456	7 9 29.0	14.194
16	0 22 26.22	1.9451	7 23 39.2	14.144
17	0 24 22.91	1.9446	7 37 46.3	14.093
18	0 26 19.57	1.9442	7 51 50.4	14.043
19	0 28 16.21	1.9439	8 5 51.4	13.991
20	0 30 12.84	1.9437	8 19 49.3	13.938
21	0 32 9.45	1.9435	8 33 43.9	13.883
22	0 34 6.06	1.9435	8 47 35.3	13.829
23	0 36 2.67	1.9435	9 1 23.4	13.774
24	0 37 59.28	1.9435	+9 15 8.2	+13.718

JANUARY 11.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	h m s	s	° ′ ″	″
0	0 37 59.28	1.9435	+ 9 15 8.2	+13.718
1	0 39 55.89	1.9437	9 28 49.6	13.662
2	0 41 52.52	1.9439	9 42 27.6	13.604
3	0 43 49.16	1.9442	9 56 2.1	13.546
4	0 45 45.82	1.9445	10 9 33.1	13.487
5	0 47 42.50	1.9448	10 23 0.5	13.427
6	0 49 39.20	1.9453	10 36 24.3	13.367
7	0 51 35.94	1.9460	10 49 44.5	13.306
8	0 53 32.72	1.9466	11 3 1.0	13.243
9	0 55 29.53	1.9472	11 16 13.7	13.181
10	0 57 26.38	1.9479	11 29 22.7	13.118
11	0 59 23.28	1.9487	11 42 27.8	13.053
12	1 1 20.22	1.9495	11 55 29.1	12.989
13	1 3 17.22	1.9505	12 8 26.5	12.923
14	1 5 14.28	1.9515	12 21 19.9	12.857
15	1 7 11.40	1.9525	12 34 9.3	12.790
16	1 9 8.58	1.9536	12 46 54.7	12.723
17	1 11 5.83	1.9548	12 59 36.0	12.654
18	1 13 3.15	1.9560	13 12 13.2	12.586
19	1 15 0.55	1.9573	13 24 46.3	12.517
20	1 16 58.02	1.9585	13 37 15.2	12.446
21	1 18 55.57	1.9599	13 49 39.8	12.374
22	1 20 53.21	1.9614	14 2 0.1	12.303
23	1 22 50.94	1.9629	+14 14 16.1	+12.230

JANUARY 12.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
0	1 24 48.76	1.9645	+14 26 27.7	+12.157
1	1 26 46.68	1.9661	14 38 34.9	12.083
2	1 28 44.69	1.9677	14 50 37.7	12.009
3	1 30 42.80	1.9694	15 2 36.0	11.934
4	1 32 41.02	1.9712	15 14 29.8	11.858
5	1 34 39.34	1.9729	15 26 19.0	11.782
6	1 36 37.77	1.9748	15 38 3.6	11.705
7	1 38 36.32	1.9768	15 49 43.6	11.628
8	1 40 34.98	1.9787	16 1 18.9	11.548
9	1 42 33.76	1.9807	16 12 49.4	11.469
10	1 44 32.66	1.9827	16 24 15.2	11.389
11	1 46 31.68	1.9847	16 35 36.1	11.308
12	1 48 30.82	1.9868	16 46 52.2	11.228
13	1 50 30.10	1.9890	16 58 3.4	11.146
14	1 52 29.50	1.9912	17 9 9.7	11.063
15	1 54 29.04	1.9934	17 20 11.0	10.981
16	1 56 28.71	1.9957	17 31 7.4	10.898
17	1 58 28.52	1.9980	17 41 58.7	10.813
18	2 0 28.47	2.0003	17 52 44.9	10.727
19	2 2 28.56	2.0028	18 3 25.9	10.641
20	2 4 28.80	2.0053	18 14 1.8	10.555
21	2 6 29.19	2.0077	18 24 32.5	10.468
22	2 8 29.72	2.0101	18 34 58.0	10.381
23	2 10 30.40	2.0127	18 45 18.2	10.292
24	2 12 31.24	2.0153	+18 55 33.0	+10.203

GREENWICH MEAN TIME.

JANUARY 13.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	h m s	s	° ′ ″	″
0	2 12 31.24	2.0153	+18 55 33.0	+10.203
1	2 14 32.23	2.0178	19 5 42.5	10.113
2	2 16 33.38	2.0204	19 15 46.6	10.023
3	2 18 34.68	2.0230	19 25 45.2	9.932
4	2 20 36.14	2.0257	19 35 38.4	9.840
5	2 22 37.76	2.0284	19 45 26.0	9.748
6	2 24 39.55	2.0312	19 55 8.1	9.655
7	2 26 41.50	2.0338	20 4 44.6	9.562
8	2 28 43.61	2.0365	20 14 15.5	9.468
9	2 30 45.88	2.0393	20 23 40.7	9.373
10	2 32 48.33	2 0423	20 33 0.2	9.277
11	2 34 50.95	2.0450	20 42 13.9	9.180
12	2 36 53.73	2.0478	20 51 21.8	9.083
13	2 38 56.68	2.0506	21 0 23.9	8.987
14	2 40 59.80	2.0535	21 9 20.2	8.888
15	2 43 3.10	2.0564	21 18 10.5	8.789
16	2 45 6.57	2.0593	21 26 54.9	8.691
17	2 47 10.21	2.0621	21 35 33.4	8.591
18	2 49 14.02	2.0650	21 44 5.8	8.490
19	2 51 18.01	2.0679	21 52 32.2	8.389
20	2 53 22.17	2.0708	22 0 52.5	8.287
21	2 55 26.51	2.0738	22 9 6.6	8.184
22	2 57 31.03	2.0768	22 17 14.6	8.082
23	2 59 35.72	2.0796	+22 25 16.4	+ 7.978

JANUARY 14.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
0	3 1 40.58	2.0825	+22 33 12.0	+ 7.874
1	3 3 45.62	2.0854	22 41 1.3	7.769
2	3 5 50.83	2.0883	22 48 44.3	7.663
3	3 7 56.22	2.0913	22 56 20.9	7.558
4	3 10 1.79	2.0943	23 3 51.2	7.451
5	3 12 7.53	2.0971	23 11 15.0	7.343
6	3 14 13.44	2.0999	23 18 32.4	7.236
7	3 16 19.52	2.1028	23 25 43.3	7.128
8	3 18 25.78	2.1058	23 32 47.7	7.018
9	3 20 32.21	2.1087	23 39 45.5	6.908
10	3 22 38.82	2.1116	23 46 36.7	6.798
11	3 24 45.60	2.1143	23 53 21.3	6.688
12	3 26 52.54	2.1171	23 59 59.3	6.578
13	3 28 59.65	2.1199	24 6 30.6	6.465
14	3 31 6.93	2.1228	24 12 55.1	6.353
15	3 33 14.38	2.1255	24 19 12.9	6.240
16	3 35 21.99	2.1283	24 25 23.9	6.126
17	3 37 29.77	2.1310	24 31 28.0	6.012
18	3 39 37.71	2.1337	24 37 25.3	5.898
19	3 41 45.81	2.1363	24 43 15.7	5.783
20	3 43 54.07	2.1390	24 48 59.2	5.668
21	3 46 2.49	2.1417	24 54 35.8	5.552
22	3 48 11.07	2.1443	25 0 5.4	5.435
23	3 50 19.80	2.1468	25 5 28.0	5.318
24	*3 52 28.68*	*2.1493*	*+25 10 43.5*	*+ 5.200*

JANUARY 15.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	h m s	s	° ′ ″	″
0	3 52 28.68	2.1493	+25 10 43.5	+5.200
1	3 54 37.72	2.1518	25 15 52.0	5.082
2	3 56 46.90	2.1543	25 20 53.3	4.963
3	3 58 56.23	2.1567	25 25 47.5	4.844
4	4 1 5.70	2.1590	25 30 34.6	4.725
5	4 3 15.31	2.1614	25 35 14.5	4.605
6	4 5 25.07	2.1638	25 39 47.2	4.484
7	4 7 34.96	2.1659	25 44 12.6	4.363
8	4 9 44.98	2.1681	25 48 30.8	4.243
9	4 11 55.13	2.1703	25 52 41.7	4.121
10	4 14 5.42	2.1725	25 56 45.3	3.999
11	4 16 15.83	2.1746	26 0 41.6	3.877
12	4 18 26.37	2.1767	26 4 30.5	3.753
13	4 20 37.03	2.1786	26 8 12.0	3.630
14	4 22 47.80	2.1805	26 11 46.1	3.507
15	4 24 58.69	2.1824	26 15 12.8	3.383
16	4 27 9.69	2.1843	26 18 32.0	3.258
17	4 29 20.80	2.1860	26 21 43.8	3.134
18	4 31 32.01	2.1878	26 24 48.1	3.009
19	4 33 43.33	2.1895	26 27 44.9	2.883
20	4 35 54.75	2.1911	26 30 34.1	2.758
21	4 38 6.26	2.1926	26 33 15.8	2.632
22	4 40 17.86	2.1941	26 35 49.9	2.505
23	4 42 29.55	2.1955	+26 38 16.4	+2.379

JANUARY 16.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
0	4 44 41.32	2.1969	+26 40 35.4	+2.253
1	4 46 53.18	2.1983	26 42 46.7	2.125
2	4 49 5.11	2.1995	26 44 50.4	1.998
3	4 51 17.12	2.2008	26 46 46.5	1.871
4	4 53 29.20	2.2018	26 48 34.9	1.743
5	4 55 41.34	2.2029	26 50 15.6	1.615
6	4 57 53.55	2.2039	26 51 48.7	1.487
7	5 0 5.81	2.2048	26 53 14.0	1.358
8	5 2 18.13	2.2058	26 54 31.7	1.230
9	5 4 30.50	2.2066	26 55 41.6	1.101
10	5 6 42.92	2.2073	26 56 43.8	0.973
11	5 8 55.38	2.2080	26 57 38.3	0.843
12	5 11 7.88	2.2087	26 58 25.0	0.714
13	5 13 20.42	2.2092	26 59 4.0	0.585
14	5 15 32.98	2.2096	26 59 35.2	0.456
15	5 17 45.57	2.2100	26 59 58.7	0.327
16	5 19 58.18	2.2103	27 0 14.4	0.198
17	5 22 10.81	2.2106	27 0 22.4	+0.068
18	5 24 23.45	2.2108	27 0 22.6	−0.062
19	5 26 36.11	2.2110	27 0 15.0	0.192
20	5 28 48.77	2.2110	26 59 59.6	0.321
21	5 31 1.43	2.2110	26 59 36.5	0.450
22	5 33 14.09	2.2109	26 59 5.6	0.580
23	5 35 26.74	2.2107	26 58 26.9	
24	5 37 39.37	2.2104	+26 57 40.4	

GREENWICH MEAN TIME.

JANUARY 17.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	h m s	s	° ′ ″	″
0	5 37 39.37	2.2104	+26 57 40.4	−0.839
1	5 39 51.99	2.2102	26 56 46.2	0.968
2	5 42 4.59	2.2098	26 55 44.2	1.098
3	5 44 17.17	2.2094	26 54 34.5	1.227
4	5 46 29.72	2.2089	26 53 17.0	1.356
5	5 48 42.24	2.2083	26 51 51.8	1.485
6	5 50 54.72	2.2077	26 50 18.8	1.614
7	5 53 7.16	2.2069	26 48 38.1	1.743
8	5 55 19.55	2.2061	26 46 49.6	1.872
9	5 57 31.89	2.2053	26 44 53.5	2.000
10	5 59 44.18	2.2044	26 42 49.6	2.129
11	6 1 56.42	2.2034	26 40 38.0	2.257
12	6 4 8.59	2.2023	26 38 18.8	2.384
13	6 6 20.70	2.2013	26 35 51.9	2.512
14	6 8 32.74	2.2000	26 33 17.4	2.639
15	6 10 44.70	2.1988	26 30 35.2	2.767
16	6 12 56.59	2.1975	26 27 45.4	2.894
17	6 15 8.40	2.1961	26 24 47.9	3.021
18	6 17 20.12	2.1946	26 21 42.9	3.147
19	6 19 31.75	2.1931	26 18 30.3	3.273
20	6 21 43.29	2.1916	26 15 10.2	3.398
21	6 23 54.74	2.1899	26 11 42.6	3.523
22	6 26 6.08	2.1882	26 8 7.4	3.649
23	6 28 17.32	2.1864	+26 4 24.7	−3.774

JANUARY 18.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
0	6 30 28.45	2.1846	+26 0 34.5	−3.898
1	6 32 39.47	2.1828	25 56 36.9	4.023
2	6 34 50.38	2.1808	25 52 31.8	4.147
3	6 37 1.17	2.1788	25 48 19.3	4.269
4	6 39 11.84	2.1768	25 43 59.5	4.392
5	6 41 22.39	2.1748	25 39 32.3	4.514
6	6 43 32.81	2.1726	25 34 57.8	4.636
7	6 45 43.10	2.1703	25 30 16.0	4.758
8	6 47 53.25	2.1681	25 25 26.9	4.879
9	6 50 3.27	2.1658	25 20 30.5	5.000
10	6 52 13.15	2.1634	25 15 26.9	5.120
11	6 54 22.88	2.1610	25 10 16.1	5.239
12	6 56 32.47	2.1586	25 4 58.2	5.358
13	6 58 41.91	2.1561	24 59 33.1	5.478
14	7 0 51.20	2.1536	24 54 0.9	5.595
15	7 3 0.34	2.1510	24 48 21.7	5.712
16	7 5 9.32	2.1483	24 42 35.5	5.829
17	7 7 18.14	2.1457	24 36 42.2	5.947
18	7 9 26.80	2.1430	24 30 41.9	6.063
19	7 11 35.30	2.1403	24 24 34.7	6.178
20	7 13 43.63	2.1375	24 18 20.6	6.293
21	7 15 51.80	2.1348	24 11 59.6	6.407
22	7 17 59.80	2.1318	24 5 31.8	6.520
23	7 20 7.62	2.1289	23 58 57.2	6.633
24	7 22 15.27	2.1260	+23 52 15.9	−6.744

JANUARY 19.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	h m s	s	° ′ ″	″
0	7 22 15.27	2.1260	+23 52 15.9	− 6.744
1	7 24 22.74	2.1231	23 45 27.9	6.857
2	7 26 30.04	2.1202	23 38 33.1	6.968
3	7 28 37.16	2.1172	23 31 31.7	7.078
4	7 30 44.10	2.1141	23 24 23.7	7.188
5	7 32 50.85	2.1110	23 17 9.2	7.297
6	7 34 57.42	2.1079	23 9 48.1	7.406
7	7 37 3.80	2.1048	23 2 20.5	7.513
8	7 39 10.00	2.1018	22 54 46.5	7.620
9	7 41 16.01	2.0986	22 47 6.1	7.727
10	7 43 21.83	2.0955	22 39 19.3	7.833
11	7 45 27.47	2.0923	22 31 26.2	7.938
12	7 47 32.91	2.0891	22 23 26.8	8.042
13	7 49 38.16	2.0859	22 15 21.2	8.145
14	7 51 43.22	2.0828	22 7 9.4	8.248
15	7 53 48.09	2.0795	21 58 51.5	8.350
16	7 55 52.76	2.0762	21 50 27.4	8.452
17	7 57 57.23	2.0729	21 41 57.3	8.552
18	8 0 1.51	2.0698	21 33 21.2	8.652
19	8 2 5.60	2.0665	21 24 39.1	8.751
20	8 4 9.49	2.0633	21 15 51.1	8.849
21	8 6 13.19	2.0600	21 6 57.2	8.947
22	8 8 16.69	2.0567	20 57 57.5	9.043
23	8 10 19.99	2.0534	+20 48 52.0	− 9.139

JANUARY 20.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
0	8 12 23.10	2.0502	+20 39 40.8	− 9.234
1	8 14 26.01	2.0469	20 30 23.9	9.329
2	8 16 28.73	2.0437	20 21 1.3	9.423
3	8 18 31.25	2.0403	20 11 33.1	9.516
4	8 20 33.57	2.0371	20 1 59.4	9.608
5	8 22 35.70	2.0338	19 52 20.1	9.700
6	8 24 37.63	2.0306	19 42 35.4	9.790
7	8 26 39.37	2.0274	19 32 45.3	9.880
8	8 28 40.92	2.0242	19 22 49.8	9.969
9	8 30 42.27	2.0210	19 12 49.0	10.057
10	8 32 43.44	2.0178	19 2 43.0	10.144
11	8 34 44.41	2.0146	18 52 31.7	10.231
12	8 36 45.19	2.0114	18 42 15.3	10.316
13	8 38 45.78	2.0083	18 31 53.8	10.401
14	8 40 46.19	2.0052	18 21 27.2	10.486
15	8 42 46.40	2.0020	18 10 55.5	10.569
16	8 44 46.43	1.9989	18 0 18.9	10.651
17	8 46 46.27	1.9958	17 49 37.4	10.733
18	8 48 45.93	1.9928	17 38 51.0	10.813
19	8 50 45.41	1.9898	17 27 59.8	10.893
20	8 52 44.71	1.9868	17 17 3.8	10.973
21	8 54 43.83	1.9838	17 6 3.1	11.051
22	8 56 42.77	1.9809	16 54 57.7	11.128
23	8 58 41.54	1.9780	16 43 47.7	11.205
24	9 0 40.13	1.9751	+16 32 33.1	−11.281

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JANUARY 21.					JANUARY 23.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	9 0 40.13	1.9751	+16 32 33.1	−11.281	0	10 32 53.54	1.8866	+6 20 1.9	−13.913
1	9 2 38.55	1.9722	16 21 14.0	11.355	1	10 34 46.72	1.8861	6 6 6.1	13.946
2	9 4 36.79	1.9693	16 9 50.5	11.429	2	10 36 39.87	1.8856	5 52 8.4	13.978
3	9 6 34.87	1.9666	15 58 22.5	11.503	3	10 38 32.99	1.8852	5 38 8.8	14.010
4	9 8 32.78	1.9638	15 46 50.1	11.575	4	10 40 26.09	1.8849	5 24 7.2	14.043
5	9 10 30.53	1.9611	15 35 13.5	11.646	5	10 42 19.18	1.8847	5 10 3.7	14.073
6	9 12 28.11	1.9583	15 23 32.6	11.717	6	10 44 12.25	1.8845	4 55 58.5	14.101
7	9 14 25.53	1.9557	15 11 47.5	11.787	7	10 46 5.32	1.8845	4 41 51.6	14.129
8	9 16 22.79	1.9530	14 59 58.2	11.856	8	10 47 58.39	1.8844	4 27 43.0	14.158
9	9 18 19.89	1.9504	14 48 4.8	11.924	9	10 49 51.45	1.8843	4 13 32.7	14.184
10	9 20 16.84	1.9479	14 36 7.3	11.992	10	10 51 44.51	1.8845	3 59 20.9	14.210
11	9 22 13.64	1.9454	14 24 5.8	12.058	11	10 53 37.59	1.8848	3 45 7.5	14.235
12	9 24 10.29	1.9429	14 12 0.4	12.123	12	10 55 30.68	1.8849	3 30 52.7	14.258
13	9 26 6.79	1.9405	13 59 51.1	12.188	13	10 57 23.78	1.8853	3 16 36.5	14.282
14	9 28 3.15	1.9381	13 47 37.9	12.252	14	10 59 16.91	1.8857	3 2 18.9	14.304
15	9 29 59.36	1.9357	13 35 20.9	12.314	15	11 1 10.06	1.8861	2 48 0.0	14.326
16	9 31 55.43	1.9334	13 23 0.2	12.377	16	11 3 3.24	1.8866	2 33 39.8	14.347
17	9 33 51.37	1.9312	13 10 35.7	12.438	17	11 4 56.45	1.8872	2 19 18.4	14.366
18	9 35 47.17	1.9289	12 58 7.6	12.498	18	11 6 49.70	1.8878	2 4 55.9	14.384
19	9 37 42.84	1.9268	12 45 35.9	12.558	19	11 8 42.99	1.8886	1 50 32.3	14.403
20	9 39 38.38	1.9246	12 33 0.6	12.617	20	11 10 36.33	1.8894	1 36 7.6	14.419
21	9 41 33.79	1.9225	12 20 21.9	12.674	21	11 12 29.72	1.8903	1 21 42.0	14.435
22	9 43 29.08	1.9205	12 7 39.7	12.732	22	11 14 23.17	1.8913	1 7 15.4	14.450
23	9 45 24.25	1.9185	+11 54 54.1	−12.788	23	11 16 16.67	1.8923	+0 52 48.0	−14.464
	JANUARY 22.					JANUARY 24.			
0	9 47 19.30	1.9166	+11 42 5.2	−12.843	0	11 18 10.24	1.8934	+0 38 19.7	−14.478
1	9 49 14.24	1.9147	11 29 13.0	12.897	1	11 20 3.88	1.8946	0 23 50.7	14.490
2	9 51 9.06	1.9128	11 16 17.6	12.951	2	11 21 57.59	1.8958	+0 9 20.9	14.502
3	9 53 3.78	1.9111	11 3 18.9	13.004	3	11 23 51.38	1.8972	−0 5 9.5	14.512
4	9 54 58.39	1.9093	10 50 17.1	13.056	4	11 25 45.25	1.8986	0 19 40.5	14.521
5	9 56 52.90	1.9077	10 37 12.2	13.107	5	11 27 39.21	1.9001	0 34 12.0	14.529
6	9 58 47.31	1.9060	10 24 4.3	13.157	6	11 29 33.26	1.9016	0 48 44.0	14.538
7	10 0 41.62	1.9044	10 10 53.4	13.206	7	11 31 27.40	1.9033	1 3 16.5	14.544
8	10 2 35.84	1.9029	9 57 39.6	13.254	8	11 33 21.65	1.9050	1 17 49.3	14.549
9	10 4 29.97	1.9015	9 44 22.9	13.302	9	11 35 16.00	1.9068	1 32 22.4	14.554
10	10 6 24.02	1.9001	9 31 3.4	13.348	10	11 37 10.46	1.9087	1 46 55.8	14.558
11	10 8 17.98	1.8987	9 17 41.1	13.395	11	11 39 5.04	1.9106	2 1 29.4	14.562
12	10 10 11.86	1.8974	9 4 16.0	13.440	12	11 40 59.73	1.9126	2 16 3.2	14.563
13	10 12 5.67	1.8962	8 50 48.3	13.483	13	11 42 54.55	1.9148	2 30 37.0	14.564
14	10 13 59.40	1.8950	8 37 18.0	13.527	14	11 44 49.50	1.9169	2 45 10.9	14.564
15	10 15 53.07	1.8939	8 23 45.1	13.569	15	11 46 44.58	1.9192	2 59 44.7	14.563
16	10 17 46.67	1.8928	8 10 9.7	13.611	16	11 48 39.80	1.9215	3 14 18.4	14.561
17	10 19 40.21	1.8918	7 56 31.8	13.652	17	11 50 35.16	1.9239	3 28 52.0	14.558
18	10 21 33.68	1.8908	7 42 51.5	13.692	18	11 52 30.67	1.9264	3 43 25.4	14.554
19	10 23 27.11	1.8900	7 29 8.8	13.731	19	11 54 26.33	1.9289	3 57 58.5	14.548
20	10 25 20.48	1.8892	7 15 23.8	13.768	20	11 56 22.14	1.9316	4 12 31.2	14.542
21	10 27 13.81	1.8884	7 1 36.6	13.805	21	11 58 18.12	1.9344	4 27 3.5	14.535
22	10 29 7.09	1.8877	6 47 47.2	13.842	22	12 0 14.27	1.9373	4 41 35.4	14.528
23	10 31 0.33	1.8871	6 33 55.6	13.878	23	12 2 10.59	1.9402	4 56 6.8	14.518
24	10 32 53.54	1.8866	+ 6 20 1.9	−13.913	24	12 4 7.09	1.9432	−5 10 37.6	−14.508

MOON, 1916.

GREENWICH MEAN TIME.

JANUARY 25.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	h m s	s	° ′ ″	″
0	12 4 7.09	1.9432	−5 10 37.6	−14.508
1	12 6 3.77	1.9462	5 25 7.7	14.497
2	12 8 0.63	1.9493	5 39 37.2	14.485
3	12 9 57.69	1.9526	5 54 5.9	14.471
4	12 11 54.94	1.9558	6 8 33.7	14.457
5	12 13 52.39	1.9593	6 23 0.7	14.442
6	12 15 50.05	1.9628	6 37 26.7	14.425
7	12 17 47.92	1.9663	6 51 51.7	14.408
8	12 19 46.00	1.9699	7 6 15.6	14.389
9	12 21 44.31	1.9737	7 20 38.4	14.369
10	12 23 42.84	1.9774	7 34 59.9	14.348
11	12 25 41.60	1.9813	7 49 20.1	14.326
12	12 27 40.60	1.9853	8 3 39.0	14.303
13	12 29 39.84	1.9894	8 17 56.5	14.278
14	12 31 39.33	1.9935	8 32 12.4	14.253
15	12 33 39.06	1.9977	8 46 26.8	14.226
16	12 35 39.05	2.0020	9 0 39.5	14.198
17	12 37 39.30	2.0064	9 14 50.5	14.169
18	12 39 39.82	2.0108	9 28 59.8	14.139
19	12 41 40.60	2.0153	9 43 7.2	14 108
20	12 43 41.66	2.0200	9 57 12.7	14.075
21	12 45 43.00	2.0248	10 11 16.2	14.042
22	12 47 44.63	2·0295	10 25 17.7	14.007
23	12 49 46.54	2.0343	−10 39 17.0	−13.970

JANUARY 26.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
0	12 51 48.75	2.0393	−10 53 14.1	−13.933
1	12 53 51.26	2.0443	11 7 8.9	13.893
2	12 55 54.07	2.0494	11 21 1.3	13.853
3	12 57 57.19	2.0547	11 34 51.3	13.813
4	13 0 0.63	2.0599	11 48 38.8	13.770
5	13 2 4.38	2.0653	12 2 23.7	13.726
6	13 4 8.46	2.0708	12 16 5.9	13.681
7	13 6 12.87	2.0763	12 29 45.4	13.635
8	13 8 17.61	2.0818	12 43 22.1	13.587
9	13 10 22.68	2.0874	12 56 55.8	13.538
10	13 12 28.10	2.0932	13 10 26.6	13.488
11	13 14 33.86	2.0990	13 23 54.3	13.435
12	13 16 39.98	2.1049	13 37 18.8	13.382
13	13 18 46.45	2.1108	13 50 40.1	13.328
14	13 20 53.28	2.1169	14 3 58.1	13.272
15	13 23 0.48	2.1230	14 17 12.7	13.214
16	13 25 8.04	2.1292	14 30 23.8	13.155
17	13 27 15.98	2.1354	14 43 31.3	13.094
18	13 29 24.29	2.1418	14 56 35.1	13.033
19	13 31 32.99	2.1482	15 9 35.2	12.970
20	13 33 42.07	2.1546	15 22 31.5	12.906
21	13 35 51.54	2.1612	15 35 23.9	12.839
22	13 38 1.41	2.1678	15 48 12.2	12.771
23	13 40 11.68	2.1745	16 0 56.4	12.703
24	13 42 22.35	2.1812	−16 13 36.5	−12.633

JANUARY 27.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	h m s	s	° ′ ″	″
0	13 42 22.35	2.1812	−16 13 36.5	−12.633
1	13 44 33.42	2.1880	16 26 12.3	12.560
2	13 46 44.91	2.1949	16 38 43.7	12.487
3	13 48 56.81	2.2018	16 51 10.7	12.412
4	13 51 9.12	2.2088	17 3 33.1	12.334
5	13 53 21.86	2.2158	17 15 50.8	12.256
6	13 55 35.02	2.2229	17 28 3.8	12.176
7	13 57 48.61	2.2301	17 40 11.9	12.094
8	14 0 2.63	2.2373	17 52 15.1	12.012
9	14 2 17.08	2.2445	18 4 13.3	11.927
10	14 4 31.97	2.2518	18 16 6.3	11.840
11	14 6 47.30	2.2593	18 27 54.1	11.753
12	14 9 3.08	2.2667	18 39 36.6	11.663
13	14 11 19.30	2.2741	18 51 13.7	11.572
14	14 13 35.97	2.2816	19 2 45.2	11.478
15	14 15 53.09	2.2891	19 14 11.1	11.383
16	14 18 10.66	2.2967	19 25 31.2	11.287
17	14 20 28.69	2.3043	19 36 45.5	11.190
18	14 22 47.18	2.3120	19 47 54.0	11.091
19	14 25 6.13	2.3197	19 58 56.4	10.988
20	14 27 25.54	2.3273	20 9 52.6	10.885
21	14 29 45.41	2.3351	20 20 42.6	10.781
22	14 32 5.75	2.3428	20 31 26.3	10.675
23	14 34 26.55	2.3506	−20 42 3.6	−10.567

JANUARY 28.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
0	14 36 47.82	2.3584	−20 52 34.3	−10.457
1	14 39 9.56	2.3663	21 2 58.4	10.345
2	14 41 31.77	2.3742	21 13 15.7	10.232
3	14 43 54.46	2.3821	21 23 26.2	10.117
4	14 46 17.62	2.3899	21 33 29.7	9.999
5	14 48 41.25	2.3978	21 43 26.1	9.880
6	14 51 5.35	2.4056	21 53 15.3	9.760
7	14 53 29.92	2.4135	22 2 57.3	9.638
8	14 55 54.97	2.4214	22 12 31.9	9.514
9	14 58 20.49	2.4293	22 21 59.0	9.388
10	15 0 46.48	2.4371	22 31 18.5	9.261
11	15 3 12.94	2.4450	22 40 30.3	9.132
12	15 5 39.88	2.4529	22 49 34.3	9.001
13	15 8 7.29	2.4607	22 58 30.4	8.868
14	15 10 35.16	2.4684	23 7 18.5	8.733
15	15 13 3.50	2.4762	23 15 58.4	8.597
16	15 15 32.30	2.4839	23 24 30.1	8.459
17	15 18 1.57	2.4917	23 32 53.5	8.319
18	15 20 31.30	2.4993	23 41 8.4	8.178
19	15 23 1.49	2.5070	23 49 14.8	8.035
20	15 25 32.14	2.5146	23 57 12.6	7.890
21	15 28 3.24	2.5221	24 5 1.6	7.743
22	15 30 34.79	2.5296	24 12 41.7	7.594
23	15 33 6.79	2.5371	24 20 12.9	7.444
24	15 35 39.24	2.5445	−24 27 35.0	− 7.293

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JANUARY 29.			
	h m s	s	° ′ ″	″
0	15 35 39.24	2.5445	−24 27 35.0	−7.293
1	15 38 12.13	2.5518	24 34 48.0	7.139
2	15 40 45.45	2.5590	24 41 51.7	6.983
3	15 43 19.21	2.5662	24 48 46.0	6.827
4	15 45 53.39	2.5733	24 55 30.9	6.668
5	15 48 28.00	2.5803	25 2 6.2	6.508
6	15 51 3.03	2.5873	25 8 31.8	6.346
7	15 53 38.47	2.5941	25 14 47.7	6.183
8	15 56 14.32	2.6008	25 20 53.7	6.018
9	15 58 50.57	2.6075	25 26 49.8	5.852
10	16 1 27.22	2.6141	25 32 35.9	5.683
11	16 4 4.26	2.6206	25 38 11.8	5.513
12	16 6 41.69	2.6269	25 43 37.5	5.343
13	16 9 19.49	2.6332	25 48 52.9	5.170
14	16 11 57.67	2.6394	25 53 57.9	4.996
15	16 14 36.22	2.6454	25 58 52.4	4.821
16	16 17 15.12	2.6513	26 3 36.4	4.644
17	16 19 54.37	2.6570	26 8 9.7	4.466
18	16 22 33.96	2.6627	26 12 32.3	4.287
19	16 25 13.89	2.6682	26 16 44.1	4.106
20	16 27 54.14	2.6735	26 20 45.0	3.923
21	16 30 34.71	2.6788	26 24 34.9	3.740
22	16 33 15.59	2.6838	26 28 13.8	3.556
23	16 35 56.77	2.6888	−26 31 41.6	−3.370
	JANUARY 30.			
0	16 38 38.25	2.6937	−26 34 58.2	−3.183
1	16 41 20.01	2.6983	26 38 3.5	2.995
2	16 44 2.04	2.7027	26 40 57.6	2.807
3	16 46 44.33	2.7070	26 43 40.3	2.616
4	16 49 26.88	2.7113	26 46 11.5	2.425
5	16 52 9.68	2.7153	26 48 31.3	2.233
6	16 54 52.71	2.7190	26 50 39.5	2.040
7	16 57 35.96	2.7226	26 52 36.1	1.846
8	17 0 19.42	2.7261	26 54 21.0	1.652
9	17 3 3.09	2.7295	26 55 54.3	1.458
10	17 5 46.96	2.7326	26 57 15.9	1.261
11	17 8 31.00	2.7355	26 58 25.6	1.063
12	17 11 15.22	2.7383	26 59 23.5	0.866
13	17 13 59.60	2.7409	27 0 9.5	0.668
14	17 16 44.13	2.7433	27 0 43.6	0.469
15	17 19 28.79	2.7454	27 1 5.8	0.270
16	17 22 13.58	2.7474	27 1 16.0	−0.070
17	17 24 58.48	2.7493	27 1 14.2	+0.130
18	17 27 43.49	2.7509	27 1 0.4	0.330
19	17 30 28.59	2.7523	27 0 34.6	0.531
20	17 33 13.77	2.7536	26 59 56.7	0.733
21	17 35 59.02	2.7547	26 59 6.7	0.933
22	17 38 44.33	2.7555	26 58 4.7	1.135
23	17 41 29.68	2.7561	26 56 50.5	1.337
24	17 44 15.06	2.7566	−26 55 24.3	+1.538

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JANUARY 31.			
	h m s	s	° ′ ″	″
0	17 44 15.06	2.7566	−26 55 24.3	+ 1.538
1	17 47 0.47	2.7568	26 53 46.0	1.740
2	17 49 45.88	2.7568	26 51 55.5	1.943
3	17 52 31.29	2.7568	26 49 52.9	2.143
4	17 55 16.69	2.7564	26 47 38.3	2.344
5	17 58 2.06	2.7558	26 45 11.6	2.546
6	18 0 47.39	2.7552	26 42 32.8	2.747
7	18 3 32.68	2.7543	26 39 42.0	2.947
8	18 6 17.91	2.7532	26 36 39.2	3.148
9	18 9 3.06	2.7518	26 33 24.3	3.348
10	18 11 48.13	2.7504	26 29 57.4	3.548
11	18 14 33.11	2.7488	26 26 18.6	3.746
12	18 17 17.98	2.7468	26 22 27.9	3.944
13	18 20 2.73	2.7448	26 18 25.3	4.143
14	18 22 47.35	2.7426	26 14 10.8	4.340
15	18 25 31.84	2.7403	26 9 44.5	4.537
16	18 28 16.18	2.7376	26 5 6.4	4.733
17	18 31 0.35	2.7348	26 0 16.6	4.928
18	18 33 44.35	2.7318	25 55 15.1	5.122
19	18 36 28.17	2.7288	25 50 2.0	5.314
20	18 39 11.80	2.7255	25 44 37.4	5.507
21	18 41 55.23	2.7221	25 39 1.2	5.698
22	18 44 38.45	2.7185	25 33 13.6	5.888
23	18 47 21.45	2.7147	−25 27 14.6	+ 6.078
	FEBRUARY 1.			
0	18 50 4.21	2.7107	−25 21 4.2	+ 6.267
1	18 52 46.73	2.7066	25 14 42.6	6.453
2	18 55 29.00	2.7024	25 8 9.8	6.639
3	18 58 11.02	2.6981	25 1 25.9	6.824
4	19 0 52.77	2.6935	24 54 30.9	7.008
5	19 3 34.24	2.6888	24 47 25.0	7.189
6	19 6 15.42	2.6839	24 40 8.2	7.369
7	19 8 56.31	2.6790	24 32 40.7	7.548
8	19 11 36.90	2.6740	24 25 2.4	7.727
9	19 14 17.19	2.6688	24 17 13.5	7.903
10	19 16 57.16	2.6635	24 9 14.0	8.078
11	19 19 36.81	2.6581	24 1 4.1	8.251
12	19 22 16.13	2.6525	23 52 43.9	8.423
13	19 24 55.11	2.6468	23 44 13.4	8.593
14	19 27 33.75	2.6411	23 35 32.8	8.761
15	19 30 12.04	2.6352	23 26 42.1	8.928
16	19 32 49.97	2.6292	23 17 41.5	9.093
17	19 35 27.54	2.6232	23 8 31.0	9.257
18	19 38 4.75	2.6170	22 59 10.7	9.418
19	19 40 41.58	2.6108	22 49 40.8	9.578
20	19 43 18.04	2.6044	22 40 1.4	9.735
21	19 45 54.11	2.5980	22 30 12.6	9.892
22	19 48 29.80	2.5915	22 20 14.4	10.047
23	19 51 5.09	2.5849	22 10 7.0	10.198
24	19 53 39.99	2.5783	−21 59 50.6	+10.348

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	FEBRUARY 2.					FEBRUARY 4.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	19 53 39.99	2.5783	−21 59 50.6	+10.348	0	21 49 21.48	2.2475	−11 28 43.7	+15.143
1	19 56 14.49	2.5717	21 49 25.2	10.498	1	21 51 36.15	2.2414	11 13 33.6	15.193
2	19 58 48.59	2.5649	21 38 50.9	10.644	2	21 53 50.45	2.2353	10 58 20.6	15.240
3	20 1 22.28	2.5581	21 28 7.9	10.788	3	21 56 4.39	2.2294	10 43 4.8	15.286
4	20 3 55.56	2.5513	21 17 16.3	10.932	4	21 58 17.98	2.2236	10 27 46.3	15.330
5	20 6 28.43	2.5443	21 6 16.1	11.073	5	22 0 31.22	2.2178	10 12 25.2	15.372
6	20 9 0.88	2.5373	20 55 7.6	11.210	6	22 2 44.11	2.2120	9 57 1.7	15.411
7	20 11 32.91	2.5303	20 43 50.9	11.347	7	22 4 56.66	2.2063	9 41 35.9	15.449
8	20 14 4.52	2.5233	20 32 26.0	11.482	8	22 7 8.87	2.2008	9 26 7.8	15.486
9	20 16 35.71	2.5163	20 20 53.1	11.615	9	22 9 20.75	2.1953	9 10 37.6	15.519
10	20 19 6.48	2.5093	20 9 12.2	11.746	10	22 11 32.30	2.1898	8 55 5.5	15.552
11	20 21 36.82	2.5021	19 57 23.6	11.873	11	22 13 43.52	2.1843	8 39 31.4	15.583
12	20 24 6.73	2.4949	19 45 27.4	12.000	12	22 15 54.42	2.1791	8 23 55.5	15.612
13	20 26 36.21	2.4878	19 33 23.6	12.124	13	22 18 5.01	2.1738	8 8 18.0	15.638
14	20 29 5.27	2.4807	19 21 12.5	12.246	14	22 20 15.28	2.1687	7 52 38.9	15.664
15	20 31 33.89	2.4734	19 8 54.1	12.366	15	22 22 25.25	2.1636	7 36 58.3	15.688
16	20 34 2.08	2.4663	18 56 28.6	12.484	16	22 24 34.91	2.1585	7 21 16.4	15.709
17	20 36 29.84	2.4591	18 43 56.0	12.600	17	22 26 44.27	2.1536	7 5 33.2	15.730
18	20 38 57.17	2.4518	18 31 16.6	12.713	18	22 28 53.34	2.1488	6 49 48.8	15.748
19	20 41 24.06	2.4446	18 18 30.4	12.825	19	22 31 2.12	2.1440	6 34 3.4	15.765
20	20 43 50.52	2.4374	18 5 37.6	12.934	20	22 33 10.62	2.1393	6 18 17.0	15.780
21	20 46 16.55	2.4303	17 52 38.3	13.042	21	22 35 18.83	2.1346	6 2 29.8	15.793
22	20 48 42.15	2.4231	17 39 32.6	13.147	22	22 37 26.77	2.1301	5 46 41.8	15.805
23	20 51 7.32	2.4158	−17 26 20.7	+13.249	23	22 39 34.44	2.1257	− 5 30 53.2	+15.815
	FEBRUARY 3.					FEBRUARY 5.			
0	20 53 32.05	2.4087	−17 13 2.7	+13.351	0	22 41 41.85	2.1213	− 5 15 4.0	+15.823
1	20 55 56.36	2.4016	16 59 38.6	13.450	1	22 43 48.99	2.1169	4 59 14.4	15.830
2	20 58 20.24	2.3945	16 46 8.7	13.546	2	22 45 55.88	2.1128	4 43 24.4	15.836
3	21 0 43.70	2.3874	16 32 33.1	13.640	3	22 48 2.52	2.1086	4 27 34.1	15.840
4	21 3 6.73	2.3803	16 18 51.9	13.733	4	22 50 8.91	2.1044	4 11 43.6	15.843
5	21 5 29.34	2.3733	16 5 5.2	13.823	5	22 52 15.05	2.1004	3 55 53.0	15.843
6	21 7 51.52	2.3663	15 51 13.2	13.911	6	22 54 20.96	2.0966	3 40 2.5	15.841
7	21 10 13.29	2.3593	15 37 15.9	13.998	7	22 56 26.64	2.0928	3 24 12.1	15.839
8	21 12 34.64	2.3523	15 23 13.5	14.082	8	22 58 32.09	2.0890	3 8 21.8	15.836
9	21 14 55.57	2.3454	15 9 6.1	14.163	9	23 0 37.32	2.0853	2 52 31.8	15.830
10	21 17 16.09	2.3386	14 54 53.9	14.243	10	23 2 42.33	2.0818	2 36 42.2	15.823
11	21 19 36.20	2.3318	14 40 37.0	14.320	11	23 4 47.13	2.0783	2 20 53.0	15.816
12	21 21 55.90	2.3249	14 26 15.5	14.396	12	23 6 51.72	2.0748	2 5 4.3	15.806
13	21 24 15.19	2.3182	14 11 49.5	14.469	13	23 8 56.11	2.0715	1 49 16.3	15.794
14	21 26 34.08	2.3115	13 57 19.2	14.540	14	23 11 0.30	2.0682	1 33 29.0	15.782
15	21 28 52.57	2.3048	13 42 44.7	14.610	15	23 13 4.29	2.0649	1 17 42.5	15.768
16	21 31 10.66	2.2983	13 28 6.0	14.678	16	23 15 8.09	2.0618	1 1 56.8	15.753
17	21 33 28.36	2.2918	13 13 23.4	14.743	17	23 17 11.71	2.0588	0 46 12.1	15.737
18	21 35 45.67	2.2853	12 58 36.9	14.806	18	23 19 15.15	2.0559	0 30 28.4	15.718
19	21 38 2.59	2.2788	12 43 46.7	14.867	19	23 21 18.42	2.0531	− 0 14 45.9	15.698
20	21 40 19.12	2.2723	12 28 52.9	14.927	20	23 23 21.52	2.0503	+ 0 0 55.4	15.678
21	21 42 35.27	2.2661	12 13 55.5	14.984	21	23 25 24.45	2.0475	0 16 35.5	15.658
22	21 44 51.05	2.2598	11 58 54.8	15.039	22	23 27 27.22	2.0449	0 32 14.3	15.634
23	21 47 6.45	2.2536	11 43 50.8	15.093	23	23 29 29.84	2.0423	0 47 51.6	15.609
24	21 49 21.48	2.2475	−11 28 43.7	+15.143	24	23 31 32.30	2.0398	+ 1 3 27.4	+15.583

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	FEBRUARY 6.					FEBRUARY 8.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	23 31 32.30	2.0398	+ 1 3 27.4	+15.583	0	1 8 0.66	2.0061	+12 40 52.2	+13.100
1	23 33 34.62	2.0375	1 19 1.6	15.557	1	1 10 1.05	2.0069	12 53 56.0	13.026
2	23 35 36.80	2.0352	1 34 34.2	15.529	2	1 12 1.49	2.0078	13 6 55.3	12.951
3	23 37 38.84	2.0329	1 50 5.1	15.499	3	1 14 1.99	2.0088	13 19 50.1	12.876
4	23 39 40.75	2.0308	2 5 34.1	15.468	4	1 16 2.55	2.0098	13 32 40.4	12.800
5	23 41 42.53	2.0287	2 21 1.3	15.437	5	1 18 3.17	2.0109	13 45 26.1	12.723
6	23 43 44.19	2.0267	2 36 26.5	15.403	6	1 20 3.86	2.0121	13 58 7.1	12.644
7	23 45 45.73	2.0248	2 51 49.7	15.370	7	1 22 4.62	2.0133	14 10 43.4	12.566
8	23 47 47.16	2.0229	3 7 10.9	15.335	8	1 24 5.45	2.0144	14 23 15.0	12.488
9	23 49 48.48	2.0211	3 22 29.9	15.298	9	1 26 6.35	2.0157	14 35 41.9	12.408
10	23 51 49.69	2.0193	3 37 46.7	15.261	10	1 28 7.33	2.0170	14 48 3.9	12.327
11	23 53 50.80	2.0178	3 53 1.2	15.222	11	1 30 8.39	2.0183	15 0 21.1	12.245
12	23 55 51.82	2.0163	4 8 13.3	15.182	12	1 32 9.53	2.0198	15 12 33.3	12.163
13	23 57 52.75	2.0148	4 23 23.0	15.141	13	1 34 10.76	2.0212	15 24 40.6	12.080
14	23 59 53.59	2.0133	4 38 30.2	15.099	14	1 36 12.07	2.0227	15 36 42.9	11.997
15	0 1 54.35	2.0120	4 53 34.9	15.057	15	1 38 13.48	2.0243	15 48 40.2	11.913
16	0 3 55.03	2.0108	5 8 37.0	15.013	16	1 40 14.98	2.0258	16 0 32.5	11.828
17	0 5 55.64	2.0096	5 23 36.4	14.968	17	1 42 16.58	2.0274	16 12 19.6	11.742
18	0 7 56.18	2.0085	5 38 33.1	14.921	18	1 44 18.27	2.0291	16 24 1.5	11.656
19	0 9 56.66	2.0074	5 53 26.9	14.873	19	1 46 20.07	2.0308	16 35 38.3	11.569
20	0 11 57.07	2.0064	6 8 17.9	14.826	20	1 48 21.97	2.0325	16 47 9.8	11.481
21	0 13 57.43	2.0056	6 23 6.0	14.777	21	1 50 23.97	2.0342	16 58 36.0	11.393
22	0 15 57.74	2.0048	6 37 51.1	14.727	22	1 52 26.07	2.0360	17 9 56.9	11.303
23	0 17 58.00	2.0039	+ 6 52 33.2	+14.675	23	1 54 28.29	2.0379	+17 21 12.4	+11.213
	FEBRUARY 7.					FEBRUARY 9.			
0	0 19 58.21	2.0033	+ 7 7 12.1	+14.623	0	1 56 30.62	2.0398	+17 32 22.5	+11.123
1	0 21 58.39	2.0027	7 21 47.9	14.569	1	1 58 33.06	2.0417	17 43 27.2	11.033
2	0 23 58.53	2.0021	7 36 20.4	14.515	2	2 0 35.62	2.0436	17 54 26.4	10.941
3	0 25 58.64	2.0017	7 50 49.7	14.461	3	2 2 38.29	2.0455	18 5 20.1	10.848
4	0 27 58.73	2.0013	8 5 15.7	14.405	4	2 4 41.08	2.0476	18 16 8.2	10.755
5	0 29 58.79	2.0008	8 19 38.3	14.348	5	2 6 44.00	2.0496	18 26 50.7	10.662
6	0 31 58.83	2.0006	8 33 57.4	14.289	6	2 8 47.03	2.0516	18 37 27.6	10.568
7	0 33 58.86	2.0003	8 48 13.0	14.231	7	2 10 50.19	2.0538	18 47 58.8	10.473
8	0 35 58.87	2.0002	9 2 25.1	14.171	8	2 12 53.48	2.0559	18 58 24.3	10.377
9	0 37 58.88	2.0001	9 16 33.5	14.110	9	2 14 56.90	2.0580	19 8 44.0	10.281
10	0 39 58.88	2.0001	9 30 38.3	14.049	10	2 17 0.44	2.0602	19 18 58.0	10.184
11	0 41 58.89	2.0002	9 44 39.4	13.987	11	2 19 4.12	2.0624	19 29 6.1	10.086
12	0 43 58.90	2.0003	9 58 36.7	13.923	12	2 21 7.93	2.0646	19 39 8.3	9.988
13	0 45 58.92	2.0004	10 12 30.2	13.859	13	2 23 11.87	2.0668	19 49 4.7	9.890
14	0 47 58.95	2.0006	10 26 19.8	13.794	14	2 25 15.95	2.0691	19 58 55.1	9.790
15	0 49 58.99	2.0008	10 40 5.5	13.728	15	2 27 20.16	2.0713	20 8 39.5	9.690
16	0 51 59.05	2.0013	10 53 47.2	13.662	16	2 29 24.51	2.0736	20 18 17.9	9.590
17	0 53 59.14	2.0017	11 7 24.9	13.595	17	2 31 28.99	2.0759	20 27 50.3	9.489
18	0 55 59.25	2.0021	11 20 58.6	13.527	18	2 33 33.62	2.0783	20 37 16.6	9.388
19	0 57 59.39	2.0027	11 34 28.1	13.458	19	2 35 38.38	2.0805	20 46 36.8	9.285
20	0 59 59.57	2.0033	11 47 53.5	13.388	20	2 37 43.28	2.0829	20 55 50.8	9.182
21	1 1 59.78	2.0038	12 1 14.6	13.317	21	2 39 48.33	2.0853	21 4 58.6	9.078
22	1 4 0.03	2.0045	12 14 31.5	13.245	22	2 41 53.51	2.0876	21 14 0.2	8.975
23	1 6 0.32	2.0053	12 27 44.0	13.173	23	2 43 58.84	2.0900	21 22 55.6	8.870
24	1 8 0.66	2.0061	+12 40 52.2	+13.100	24	2 46 4.31	2.0923	+21 31 44.6	+ 8.764

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	FEBRUARY 10.					FEBRUARY 12.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	2 46 4.31	2.0923	+21 31 44.6	+8.764	0	4 29 7.05	2.1928	+26 21 39.5	+3.148
1	2 48 9.92	2.0948	21 40 27.3	8.659	1	4 31 18.65	2.1940	26 24 44.6	3.022
2	2 50 15.68	2.0972	21 49 3.7	8.553	2	4 33 30.33	2.1953	26 27 42.1	2.896
3	2 52 21.58	2.0996	21 57 33.7	8.446	3	4 35 42.09	2.1966	26 30 32.0	2.769
4	2 54 27.63	2.1020	22 5 57.2	8.338	4	4 37 53.92	2.1978	26 33 14.4	2.643
5	2 56 33.82	2.1044	22 14 14.3	8.231	5	4 40 5.82	2.1988	26 35 49.1	2.514
6	2 58 40.16	2.1068	22 22 24.9	8.122	6	4 42 17.78	2.1999	26 38 16.1	2.387
7	3 0 46.64	2.1093	22 30 28.9	8.013	7	4 44 29.81	2.2010	26 40 35.5	2.259
8	3 2 53.26	2.1116	22 38 26.4	7.903	8	4 46 41.90	2.2019	26 42 47.2	2.132
9	3 5 0.03	2.1140	22 46 17.3	7.793	9	4 48 54.04	2.2028	26 44 51.3	2.004
10	3 7 6.94	2.1164	22 54 1.6	7.683	10	4 51 6.24	2.2037	26 46 47.7	1.876
11	3 9 14.00	2.1188	23 1 39.2	7.572	11	4 53 18.48	2.2044	26 48 36.4	1.748
12	3 11 21.20	2.1212	23 9 10.2	7.460	12	4 55 30.77	2.2053	26 50 17.4	1.619
13	3 13 28.54	2.1236	23 16 34.4	7.348	13	4 57 43.11	2.2059	26 51 50.7	1.491
14	3 15 36.03	2.1260	23 23 51.9	7.235	14	4 59 55.48	2.2065	26 53 16.3	1.363
15	3 17 43.66	2.1283	23 31 2.6	7.122	15	5 2 7.89	2.2071	26 54 34.2	1.233
16	3 19 51.42	2.1306	23 38 6.5	7.008	16	5 4 20.33	2.2076	26 55 44.3	1.104
17	3 21 59.33	2.1330	23 45 3.6	6.894	17	5 6 32.80	2.2081	26 56 46.7	0.975
18	3 24 7.38	2.1353	23 51 53.8	6.779	18	5 8 45.30	2.2085	26 57 41.4	0.847
19	3 26 15.57	2.1376	23 58 37.1	6.664	19	5 10 57.82	2.2088	26 58 28.3	0.718
20	3 28 23.89	2.1399	24 5 13.5	6.549	20	5 13 10.36	2.2091	26 59 7.5	0.589
21	3 30 32.36	2.1423	24 11 43.0	6.433	21	5 15 22.91	2.2093	26 59 39.0	0.460
22	3 32 40.96	2.1444	24 18 5.5	6.317	22	5 17 35.47	2.2094	27 0 2.7	0.330
23	3 34 49.69	2.1467	+24 24 21.0	+6.199	23	5 19 48.04	2.2096	+27 0 18.6	+0.201
	FEBRUARY 11.					FEBRUARY 13.			
0	3 36 58.56	2.1489	+24 30 29.4	+6.082	0	5 22 0.62	2.2097	+27 0 26.8	+0.072
1	3 39 7.56	2.1511	24 36 30.8	5.964	1	5 24 13.20	2.2096	27 0 27.2	−0.058
2	3 41 16.69	2.1533	24 42 25.1	5.846	2	5 26 25.77	2.2095	27 0 19.9	0.186
3	3 43 25.95	2.1554	24 48 12.3	5.727	3	5 28 38.34	2.2094	27 0 4.9	0.315
4	3 45 35.34	2.1576	24 53 52.3	5.608	4	5 30 50.90	2.2092	26 59 42.1	0.445
5	3 47 44.86	2.1597	24 59 25.2	5.488	5	5 33 3.44	2.2088	26 59 11.5	0.574
6	3 49 54.50	2.1617	25 4 50.9	5.368	6	5 35 15.96	2.2086	26 58 33.2	0.703
7	3 52 4.26	2.1638	25 10 9.4	5.248	7	5 37 28.47	2.2083	26 57 47.2	0.832
8	3 54 14.15	2.1658	25 15 20.7	5.128	8	5 39 40.95	2.2078	26 56 53.4	0.961
9	3 56 24.15	2.1677	25 20 24.7	5.006	9	5 41 53.40	2.2073	26 55 51.9	1.090
10	3 58 34.27	2.1697	25 25 21.4	4.884	10	5 44 5.82	2.2067	26 54 42.6	1.218
11	4 0 44.51	2.1716	25 30 10.8	4.763	11	5 46 18.20	2.2060	26 53 25.7	1.347
12	4 2 54.86	2.1734	25 34 52.9	4.640	12	5 48 30.54	2.2053	26 52 1.0	1.476
13	4 5 5.32	2.1753	25 39 27.6	4.518	13	5 50 42.84	2.2046	26 50 28.6	1.604
14	4 7 15.89	2.1771	25 43 55.0	4.395	14	5 52 55.09	2.2038	26 48 48.5	1.732
15	4 9 26.57	2.1788	25 48 15.0	4.272	15	5 55 7.30	2.2030	26 47 0.8	1.859
16	4 11 37.35	2.1805	25 52 27.6	4.148	16	5 57 19.45	2.2020	26 45 5.4	1.988
17	4 13 48.23	2.1822	25 56 32.8	4.024	17	5 59 31.54	2.2010	26 43 2.3	2.116
18	4 15 59.21	2.1838	26 0 30.5	3.900	18	6 1 43.57	2.2000	26 40 51.5	2.243
19	4 18 10.29	2.1855	26 4 20.8	3.776	19	6 3 55.54	2.1990	26 38 33.1	2.370
20	4 20 21.47	2.1870	26 8 3.6	3.651	20	6 6 7.45	2.1978	26 36 7.1	2.496
21	4 22 32.73	2.1884	26 11 38.9	3.525	21	6 8 19.28	2.1966	26 33 33.4	2.625
22	4 24 44.08	2.1899	26 15 6.6	3.399	22	6 10 31.04	2.1953	26 30 52.1	2.751
23	4 26 55.52	2.1914	26 18 26.8	3.274	23	6 12 42.72	2.1940	26 28 3.3	2.877
24	4 29 7.05	2.1928	+26 21 39.5	+3.148	24	6 14 54.32	2.1926	+26 25 6.9	−3.003

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	FEBRUARY 14.					FEBRUARY 16.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	6 14 54.32	2.1926	+26 25 6.9	−3.003	0	7 57 42.94	2.0787	+21 43 5.2	− 8.554
1	6 17 5.83	2.1912	26 22 2.9	3.129	1	7 59 47.57	2.0758	21 34 28.9	8.656
2	6 19 17.26	2.1898	26 18 51.4	3.254	2	8 1 52.03	2.0728	21 25 46.5	8.757
3	6 21 28.60	2.1882	26 15 32.4	3.380	3	8 3 56.31	2.0699	21 16 58.1	8.857
4	6 23 39.84	2.1866	26 12 5.8	3.506	4	8 6 0.42	2.0670	21 8 3.7	8.956
5	6 25 50.99	2.1850	26 8 31.7	3.630	5	8 8 4.35	2.0640	20 59 3.4	9.055
6	6 28 2.04	2.1833	26 4 50.2	3.754	6	8 10 8.10	2.0611	20 49 57.1	9.153
7	6 30 12.98	2.1814	26 1 1.2	3.878	7	8 12 11.68	2.0582	20 40 45.0	9.250
8	6 32 23.81	2.1797	25 57 4.8	4.002	8	8 14 15.08	2.0552	20 31 27.1	9.347
9	6 34 34.54	2.1779	25 53 1.0	4.125	9	8 16 18.30	2.0522	20 22 3.4	9.443
10	6 36 45.16	2.1760	25 48 49.8	4.248	10	8 18 21.34	2.0493	20 12 34.0	9.538
11	6 38 55.66	2.1740	25 44 31.3	4.370	11	8 20 24.21	2.0464	20 2 58.9	9.633
12	6 41 6.04	2.1720	25 40 5.4	4.493	12	8 22 26.91	2.0435	19 53 18.1	9.727
13	6 43 16.30	2.1700	25 35 32.2	4.614	13	8 24 29.43	2.0406	19 43 31.7	9.819
14	6 45 26.44	2.1679	25 30 51.7	4.736	14	8 26 31.78	2.0377	19 33 39.8	9.911
15	6 47 36.45	2.1658	25 26 3.9	4.857	15	8 28 33.95	2.0348	19 23 42.4	10.003
16	6 49 46.34	2.1637	25 21 8.9	4.977	16	8 30 35.95	2.0319	19 13 39.5	10.093
17	6 51 56.09	2.1614	25 16 6.7	5.097	17	8 32 37.78	2.0290	19 3 31.2	10.183
18	6 54 5.71	2.1593	25 10 57.3	5.217	18	8 34 39.43	2.0261	18 53 17.6	10.272
19	6 56 15.20	2.1570	25 5 40.7	5.336	19	8 36 40.91	2.0233	18 42 58.6	10.361
20	6 58 24.55	2.1547	25 0 17.0	5.454	20	8 38 42.23	2.0206	18 32 34.3	10.448
21	7 0 33.76	2.1523	24 54 46.2	5.573	21	8 40 43.38	2.0178	18 22 4.8	10.535
22	7 2 42.82	2.1498	24 49 8.3	5.690	22	8 42 44.36	2.0149	18 11 30.1	10.622
23	7 4 51.74	2.1475	+24 43 23.4	−5.808	23	8 44 45.17	2.0122	+18 0 50.2	−10.707
	FEBRUARY 15.					FEBRUARY 17.			
0	7 7 0.52	2.1450	+24 37 31.4	−5.925	0	8 46 45.82	2.0094	+17 50 5.3	−10.790
1	7 9 9.14	2.1425	24 31 32.4	6.041	1	8 48 46.30	2.0067	17 39 15.4	10.874
2	7 11 17.62	2.1401	24 25 26.5	6.156	2	8 50 46.62	2.0040	17 28 20.4	10.958
3	7 13 25.95	2.1375	24 19 13.7	6.271	3	8 52 46.78	2.0013	17 17 20.5	11.039
4	7 15 34.12	2.1348	24 12 54.0	6.386	4	8 54 46.78	1.9987	17 6 15.7	11.120
5	7 17 42.13	2.1322	24 6 27.4	6.500	5	8 56 46.62	1.9961	16 55 6.1	11.200
6	7 19 49.98	2.1296	23 59 54.0	6.613	6	8 58 46.31	1.9935	16 43 51.7	11.280
7	7 21 57.68	2.1270	23 53 13.8	6.727	7	9 0 45.84	1.9909	16 32 32.5	11.359
8	7 24 5.22	2.1243	23 46 26.8	6.839	8	9 2 45.22	1.9883	16 21 8.6	11.437
9	7 26 12.59	2.1215	23 39 33.1	6.951	9	9 4 44.44	1.9858	16 9 40.1	11.513
10	7 28 19.80	2.1188	23 32 32.7	7.062	10	9 6 43.51	1.9833	15 58 7.0	11.590
11	7 30 26.84	2.1160	23 25 25.7	7.173	11	9 8 42.44	1.9809	15 46 29.3	11.666
12	7 32 33.72	2.1133	23 18 12.0	7.283	12	9 10 41.22	1.9785	15 34 47.1	11.740
13	7 34 40.43	2.1104	23 10 51.8	7.392	13	9 12 39.86	1.9761	15 23 0.5	11.813
14	7 36 46.97	2.1077	23 3 25.0	7.501	14	9 14 38.35	1.9737	15 11 9.5	11.887
15	7 38 53.35	2.1048	22 55 51.7	7.609	15	9 16 36.70	1.9713	14 59 14.1	11.959
16	7 40 59.55	2.1019	22 48 11.9	7.717	16	9 18 34.91	1.9691	14 47 14.4	12.030
17	7 43 5.58	2.0991	22 40 25.7	7.823	17	9 20 32.99	1.9668	14 35 10.5	12.100
18	7 45 11.44	2.0963	22 32 33.1	7.930	18	9 22 30.93	1.9646	14 23 2.4	12.170
19	7 47 17.13	2.0933	22 24 34.1	8.036	19	9 24 28.74	1.9624	14 10 50.1	12.238
20	7 49 22.64	2.0904	22 16 28.8	8.141	20	9 26 26.42	1.9603	13 58 33.8	12.306
21	7 51 27.98	2.0875	22 8 17.2	8.245	21	9 28 23.97	1.9582	13 46 13.4	12.373
22	7 53 33.14	2.0846	21 59 59.4	8.348	22	9 30 21.40	1.9561	13 33 49.0	12.439
23	7 55 38.13	2.0817	21 51 35.4	8.452	23	9 32 18.70	1.9540	13 21 20.7	12.504
24	7 57 42.94	*2.0787*	*+21 43 5.2*	*−8.554*	24	9 34 15.88	1.9520	+13 8 48.5	−12.568

MOON, 1916.

GREENWICH MEAN TIME.

FEBRUARY 18.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	h m s	s	° ′ ″	″
0	9 34 15.88	1.9520	+13 8 48.5	−12.568
1	9 36 12.94	1.9501	12 56 12.5	12.632
2	9 38 9.89	1.9483	12 43 32.7	12.694
3	9 40 6.73	1.9464	12 30 49.2	12.756
4	9 42 3.46	1.9446	12 18 2.0	12.817
5	9 44 0.08	1.9428	12 5 11.2	12.877
6	9 45 56.59	1.9410	11 52 16.8	12.936
7	9 47 53.00	1.9393	11 39 18.9	12.994
8	9 49 49.31	1.9378	11 26 17.5	13.052
9	9 51 45.53	1.9362	11 13 12.7	13.108
10	9 53 41.65	1.9346	11 0 4.6	13.163
11	9 55 37.68	1.9331	10 46 53.2	13.218
12	9 57 33.62	1.9317	10 33 38.5	13.271
13	9 59 29.48	1.9303	10 20 20.7	13.323
14	10 1 25.25	1.9288	10 6 59.7	13.376
15	10 3 20.94	1.9276	9 53 35.6	13.427
16	10 5 16.56	1.9264	9 40 8.5	13.476
17	10 7 12.11	1.9252	9 26 38.5	13.525
18	10 9 7.58	1.9240	9 13 5.5	13.573
19	10 11 2.99	1.9230	8 59 29.7	13.621
20	10 12 58.34	1.9220	8 45 51.0	13.668
21	10 14 53.63	1.9210	8 32 9.6	13.713
22	10 16 48.86	1.9201	8 18 25.5	13.757
23	10 18 44.04	1.9192	+ 8 4 38.8	−13.800

FEBRUARY 19.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
0	10 20 39.16	1.9183	+ 7 50 49.5	−13.843
1	10 22 34.24	1.9176	7 36 57.7	13.884
2	10 24 29.27	1.9169	7 23 3.4	13.925
3	10 26 24.27	1.9163	7 9 6.7	13.965
4	10 28 19.23	1.9157	6 55 7.6	14.003
5	10 30 14.15	1.9152	6 41 6.3	14.041
6	10 32 9.05	1.9148	6 27 2.7	14.078
7	10 34 3.92	1.9143	6 12 56.9	14.114
8	10 35 58.76	1.9139	5 58 49.0	14.149
9	10 37 53.59	1.9137	5 44 39.0	14.183
10	10 39 48.40	1.9134	5 30 27.0	14.217
11	10 41 43.20	1.9133	5 16 13.0	14.248
12	10 43 37.99	1.9132	5 1 57.2	14.279
13	10 45 32.78	1.9132	4 47 39.5	14.309
14	10 47 27.57	1.9132	4 33 20.1	14.338
15	10 49 22.36	1.9133	4 18 58.9	14.368
16	10 51 17.16	1.9133	4 4 36.0	14.394
17	10 53 11.96	1.9135	3 50 11.6	14.420
18	10 55 6.78	1.9138	3 35 45.6	14.446
19	10 57 1.62	1.9142	3 21 18.1	14.470
20	10 58 56.48	1.9146	3 6 49.2	14.493
21	11 0 51.37	1.9150	2 52 19.0	14.515
22	11 2 46.28	1.9155	2 37 47.4	14.537
23	11 4 41.23	1.9162	2 23 14.6	14.557
24	11 6 36.22	1.9168	+ 2 8 40.6	−14.576

FEBRUARY 20.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	h m s	s	° ′ ″	″
0	11 6 36.22	1.9168	+2 8 40.6	−14.576
1	11 8 31.25	1.9175	1 54 5.5	14.593
2	11 10 26.32	1.9183	1 39 29.4	14.611
3	11 12 21.45	1.9193	1 24 52.2	14.628
4	11 14 16.63	1.9201	1 10 14.1	14.643
5	11 16 11.86	1.9211	0 55 35.1	14.657
6	11 18 7.16	1.9222	0 40 55.3	14.669
7	11 20 2.52	1.9233	0 26 14.8	14.681
8	11 21 57.95	1.9245	+0 11 33.6	14.692
9	11 23 53.46	1.9258	−0 3 8.2	14.702
10	11 25 49.04	1.9271	0 17 50.6	14.711
11	11 27 44.71	1.9285	0 32 33.5	14.719
12	11 29 40.46	1.9299	0 47 16.9	14.726
13	11 31 36.30	1.9315	1 2 0.6	14.731
14	11 33 32.24	1.9332	1 16 44.6	14.736
15	11 35 28.28	1.9348	1 31 28.9	14.740
16	11 37 24.42	1.9365	1 46 13.4	14.743
17	11 39 20.66	1.9383	2 0 58.0	14.743
18	11 41 17.02	1.9403	2 15 42.6	14.743
19	11 43 13.50	1.9423	2 30 27.2	14.743
20	11 45 10.09	1.9442	2 45 11.7	14.740
21	11 47 6.80	1.9463	2 59 56.0	14.738
22	11 49 3.65	1.9486	3 14 40.2	14.734
23	11 51 0.63	1.9508	−3 29 24.1	−14.728

FEBRUARY 21.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
0	11 52 57.74	1.9531	−3 44 7.6	−14.722
1	11 54 55.00	1.9555	3 58 50.7	14.714
2	11 56 52.40	1.9579	4 13 33.3	14.706
3	11 58 49.95	1.9604	4 28 15.4	14.696
4	12 0 47.65	1.9630	4 42 56.8	14.685
5	12 2 45.51	1.9658	4 57 37.6	14.673
6	12 4 43.54	1.9686	5 12 17.6	14.660
7	12 6 41.74	1.9713	5 26 56.8	14.646
8	12 8 40.10	1.9742	5 41 35.1	14.631
9	12 10 38.64	1.9772	5 56 12.5	14.614
10	12 12 37.36	1.9803	6 10 48.8	14.596
11	12 14 36.27	1.9833	6 25 24.0	14.577
12	12 16 35.36	1.9865	6 39 58.0	14.557
13	12 18 34.65	1.9898	6 54 30.8	14.535
14	12 20 34.13	1.9931	7 9 2.2	14.513
15	12 22 33.82	1.9965	7 23 32.3	14.489
16	12 24 33.71	1.9999	7 38 0.9	14.463
17	12 26 33.81	2.0035	7 52 27.9	14.438
18	12 28 34.13	2.0071	8 6 53.4	14.411
19	12 30 34.66	2.0108	8 21 17.2	14.382
20	12 32 35.42	2.0146	8 35 39.2	14.351
21	12 34 36.41	2.0184	8 49 59.3	14.320
22	12 36 37.63	2.0223	9 4 17.6	14.288
23	12 38 39.08	2.0262	9 18 33.9	14.254
24	12 40 40.77	2.0303	−9 32 48.1	−14.219

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	FEBRUARY 22.			
	h m s	s	° ′ ″	″
0	12 40 40.77	2.0303	− 9 32 48.1	−14.219
1	12 42 42.71	2.0344	9 47 0.2	14.183
2	12 44 44.90	2.0386	10 1 10.1	14.146
3	12 46 47.34	2.0428	10 15 17.7	14.107
4	12 48 50.04	2.0472	10 29 22.9	14.067
5	12 50 53.00	2.0515	10 43 25.7	14.026
6	12 52 56.22	2.0559	10 57 26.0	13.983
7	12 54 59.71	2.0605	11 11 23.7	13.939
8	12 57 3.48	2.0651	11 25 18.7	13.894
9	12 59 7.52	2.0698	11 39 11.0	13.848
10	13 1 11.85	2.0745	11 53 0.4	13.799
11	13 3 16.46	2.0793	12 6 46.9	13.750
12	13 5 21.36	2.0842	12 20 30.4	13.699
13	13 7 26.56	2.0891	12 34 10.8	13.648
14	13 9 32.05	2.0940	12 47 48.1	13.595
15	13 11 37.84	2.0991	13 1 22.2	13.540
16	13 13 43.94	2.1043	13 14 52.9	13.483
17	13 15 50.35	2.1094	13 28 20.2	13.426
18	13 17 57.07	2.1147	13 41 44.0	13.368
19	13 20 4.11	2.1199	13 55 4.3	13.308
20	13 22 11.46	2.1253	14 8 20.9	13.246
21	13 24 19.14	2.1308	14 21 33.8	13.183
22	13 26 27.15	2.1363	14 34 42.9	13.118
23	13 28 35.49	2.1418	−14 47 48.0	−13.053
	FEBRUARY 23.			
0	13 30 44.16	2.1473	−15 0 49.2	−12.986
1	13 32 53.17	2.1530	15 13 46.3	12.917
2	13 35 2.52	2.1588	15 26 39.2	12.847
3	13 37 12.22	2.1645	15 39 27.9	12.776
4	13 39 22.26	2.1703	15 52 12.3	12.703
5	13 41 32.65	2.1762	16 4 52.2	12.628
6	13 43 43.40	2.1822	16 17 27.6	12.552
7	13 45 54.51	2.1881	16 29 58.4	12.474
8	13 48 5.97	2.1941	16 42 24.5	12.396
9	13 50 17.80	2.2003	16 54 45.9	12.316
10	13 52 30.00	2.2063	17 7 2.4	12.234
11	13 54 42.56	2.2124	17 19 14.0	12.151
12	13 56 55.49	2.2187	17 31 20.5	12.066
13	13 59 8.80	2.2249	17 43 21.9	11.980
14	14 1 22.48	2.2312	17 55 18.1	11.892
15	14 3 36.54	2.2375	18 7 8.9	11.802
16	14 5 50.98	2.2438	18 18 54.3	11.712
17	14 8 5.80	2.2503	18 30 34.3	11.620
18	14 10 21.01	2.2567	18 42 8.7	11.526
19	14 12 36.60	2.2631	18 53 37.4	11.430
20	14 14 52.58	2.2697	19 5 0.3	11.333
21	14 17 8.96	2.2762	19 16 17.4	11.235
22	14 19 25.72	2.2827	19 27 28.5	11.135
23	14 21 42.88	2.2893	19 38 33.6	11.033
24	14 24 *0.43*	*2.2958*	*−19 49 32.5*	*−10.930*

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	FEBRUARY 24.			
	h m s	s	° ′ ″	″
0	14 24 0.43	2.2958	−19 49 32.5	−10.930
1	14 26 18.58	2.3025	20 0 25.2	10.826
2	14 28 36.73	2.3091	20 11 11.6	10.720
3	14 30 55.47	2.3158	20 21 51.6	10.613
4	14 33 14.62	2.3224	20 32 25.1	10.503
5	14 35 34.16	2.3290	20 42 52.0	10.393
6	14 37 54.10	2.3358	20 53 12.2	10.280
7	14 40 14.45	2.3425	21 3 25.6	10.166
8	14 42 35.20	2.3492	21 13 32.1	10.051
9	14 44 56.35	2.3558	21 23 31.7	9.934
10	14 47 17.90	2.3625	21 33 24.2	9.815
11	14 49 39.85	2.3693	21 43 9.5	9.695
12	14 52 2.21	2.3759	21 52 47.6	9.574
13	14 54 24.96	2.3826	22 2 18.4	9.451
14	14 56 48.12	2.3893	22 11 41.7	9.326
15	14 59 11.68	2.3960	22 20 57.5	9.200
16	15 1 35.64	2.4026	22 30 5.7	9.072
17	15 3 59.99	2.4092	22 39 6.1	8.943
18	15 6 24.74	2.4158	22 47 58.8	8.813
19	15 8 49.89	2.4224	22 56 43.6	8.680
20	15 11 15.43	2.4289	23 5 20.4	8.547
21	15 13 41.36	2.4354	23 13 49.2	8.412
22	15 16 7.68	2.4419	23 22 9.8	8.275
23	15 18 34.39	2.4484	−23 30 22.2	− 8.137
	FEBRUARY 25.			
0	15 21 1.49	2.4548	−23 38 26.2	− 7.997
1	15 23 28.97	2.4613	23 46 21.8	7.856
2	15 25 56.84	2.4676	23 54 8.9	7.713
3	15 28 25.08	2.4738	24 1 47.4	7.569
4	15 30 53.70	2.4801	24 9 17.2	7.423
5	15 33 22.69	2.4863	24 16 38.2	7.277
6	15 35 52.05	2.4923	24 23 50.4	7.129
7	15 38 21.77	2.4984	24 30 53.7	6.979
8	15 40 51.86	2.5045	24 37 47.9	6.828
9	15 43 22.31	2.5104	24 44 33.0	6.675
10	15 45 53.11	2.5163	24 51 8.9	6.522
11	15 48 24.26	2.5220	24 57 35.6	6.368
12	15 50 55.75	2.5278	25 3 53.0	6.211
13	15 53 27.59	2.5334	25 10 0.9	6.053
14	15 55 59.76	2.5390	25 15 59.3	5.893
15	15 58 32.27	2.5445	25 21 48.1	5.733
16	16 1 5.10	2.5498	25 27 27.3	5.573
17	16 3 38.25	2.5552	25 32 56.8	5.409
18	16 6 11.72	2.5603	25 38 16.4	5.245
19	16 8 45.49	2.5654	25 43 26.2	5.081
20	16 11 19.57	2.5704	25 48 26.1	4.915
21	16 13 53.94	2.5753	25 53 16.0	4.748
22	16 16 28.61	2.5802	25 57 55.8	4.578
23	16 19 3.56	2.5848	26 2 25.4	4.408
24	16 21 38.79	2.5894	−26 6 44.8	− 4.238

MOON, 1916.

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	FEBRUARY 26.					FEBRUARY 28.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	16 21 38.79	2.5894	−26 6 44.8	−4.238	0	18 28 36.94	2.6430	−26 0 55.7	+ 4.569
1	16 24 14.29	2.5939	26 10 54.0	4.067	1	18 31 15.44	2.6404	25 56 16.1	4.750
2	16 26 50.06	2.5983	26 14 52.8	3.893	2	18 33 53.79	2.6378	25 51 25.7	4.930
3	16 29 26.08	2.6024	26 18 41.2	3.720	3	18 36 31.97	2.6349	25 46 24.5	5.110
4	16 32 2.35	2.6066	26 22 19.2	3.546	4	18 39 9.98	2.6319	25 41 12.5	5.289
5	16 34 38.87	2.6106	26 25 46.7	3.370	5	18 41 47.80	2.6288	25 35 49.8	5.468
6	16 37 15.62	2.6144	26 29 3.6	3.193	6	18 44 25.43	2.6255	25 30 16.4	5.645
7	16 39 52.60	2.6182	26 32 9.9	3.017	7	18 47 2.86	2.6221	25 24 32.4	5.822
8	16 42 29.80	2.6218	26 35 5.6	2.838	8	18 49 40.08	2.6187	25 18 37.8	5.998
9	16 45 7.21	2.6253	26 37 50.5	2.659	9	18 52 17.10	2.6151	25 12 32.7	6.172
10	16 47 44.83	2.6286	26 40 24.7	2.480	10	18 54 53.89	2.6113	25 6 17.2	6.345
11	16 50 22.64	2.6318	26 42 48.1	2.299	11	18 57 30.46	2.6075	24 59 51.3	6.518
12	16 53 0.64	2.6348	26 45 0.6	2.118	12	19 0 6.79	2.6035	24 53 15.1	6.689
13	16 55 38.82	2.6378	26 47 2.3	1.937	13	19 2 42.88	2.5994	24 46 28.6	6.860
14	16 58 17.17	2.6405	26 48 53.0	1.753	14	19 5 18.72	2.5953	24 39 31.9	7.029
15	17 0 55.68	2.6431	26 50 32.7	1.570	15	19 7 54.31	2.5910	24 32 25.1	7.197
16	17 3 34.34	2.6456	26 52 1.4	1.387	16	19 10 29.64	2.5866	24 25 8.3	7.363
17	17 6 13.15	2.6479	26 53 19.1	1.203	17	19 13 4.70	2.5821	24 17 41.5	7.530
18	17 8 52.09	2.6501	26 54 25.7	1.018	18	19 15 39.49	2.5775	24 10 4.7	7.694
19	17 11 31.16	2.6521	26 55 21.3	0.833	19	19 18 14.00	2.5728	24 2 18.2	7.858
20	17 14 10.34	2.6539	26 56 5.7	0.647	20	19 20 48.23	2.5681	23 54 21.8	8.020
21	17 16 49.63	2.6558	26 56 38.9	0.461	21	19 23 22.17	2.5633	23 46 15.8	8.180
22	17 19 29.03	2.6573	26 57 1.0	0.275	22	19 25 55.82	2.5583	23 38 0.2	8.339
23	17 22 8.51	2.6587	−26 57 11.9	−0.088	23	19 28 29.17	2.5533	−23 29 35.1	+ 8.498
	FEBRUARY 27.					FEBRUARY 29.			
0	17 24 48.07	2.6599	−26 57 11.6	+0.098	0	19 31 2.21	2.5482	−23 21 0.5	+ 8.654
1	17 27 27.70	2.6610	26 57 0.1	0.286	1	19 33 34.95	2.5430	23 12 16.6	8.809
2	17 30 7.39	2.6620	26 56 37.3	0.473	2	19 36 7.37	2.5378	23 3 23.4	8.963
3	17 32 47.14	2.6628	26 56 3.3	0.661	3	19 38 39.48	2.5325	22 54 21.1	9.115
4	17 35 26.92	2.6633	26 55 18.0	0.848	4	19 41 11.27	2.5272	22 45 9.6	9.266
5	17 38 6.74	2.6638	26 54 21.5	1.036	5	19 43 42.74	2.5218	22 35 49.2	9.415
6	17 40 46.58	2.6642	26 53 13.7	1.224	6	19 46 13.88	2.5162	22 26 19.8	9.563
7	17 43 26.44	2.6643	26 51 54.6	1.412	7	19 48 44.68	2.5106	22 16 41.6	9.709
8	17 46 6.30	2.6643	26 50 24.3	1.599	8	19 51 15.15	2.5051	22 6 54.7	9.853
9	17 48 46.15	2.6641	26 48 42.7	1.788	9	19 53 45.29	2.4994	21 56 59.2	9.997
10	17 51 25.99	2.6638	26 46 49.8	1.975	10	19 56 15.08	2.4937	21 46 55.1	10.138
11	17 54 5.81	2.6633	26 44 45.7	2.163	11	19 58 44.53	2.4880	21 36 42.6	10.278
12	17 56 45.59	2.6627	26 42 30.3	2.350	12	20 1 13.64	2.4823	21 26 21.7	10.417
13	17 59 25.33	2.6618	26 40 3.7	2.537	13	20 3 42.40	2.4764	21 15 52.6	10.553
14	18 2 5.01	2.6608	26 37 25.9	2.723	14	20 6 10.81	2.4705	21 5 15.3	10.688
15	18 4 44.63	2.6598	26 34 36.9	2.910	15	20 8 38.86	2.4646	20 54 30.0	10.821
16	18 7 24.18	2.6585	26 31 36.7	3.097	16	20 11 6.56	2.4588	20 43 36.8	10.953
17	18 10 3.65	2.6571	26 28 25.3	3.283	17	20 13 33.91	2.4528	20 32 35.7	11.083
18	18 12 43.03	2.6555	26 25 2.8	3.468	18	20 16 0.90	2.4468	20 21 26.8	11.212
19	18 15 22.31	2.6538	26 21 29.2	3.653	19	20 18 27.53	2.4408	20 10 10.3	11.338
20	18 18 1.49	2.6520	26 17 44.5	3.837	20	20 20 53.80	2.4349	19 58 46.3	11.463
21	18 20 40.55	2.6499	26 13 48.8	4.020	21	20 23 19.72	2.4289	19 47 14.8	11.586
22	18 23 19.48	2.6478	26 9 42.1	4.203	22	20 25 45.27	2.4228	19 35 36.0	11.707
23	18 25 58.28	2.6455	26 5 24.4	4.387	23	20 28 10.46	2.4168	19 23 50.0	11.827
24	*18 28 36.94*	*2.6430*	−26 0 55.7	+4.569	24	20 30 35.29	2.4108	−19 11 56.8	+11.945

GREENWICH MEAN TIME.

MARCH 1.

Hour.	Right Ascension.			Var. per Min.	Declination.			Var. per Min.
	h	m	s	s	°	′	″	″
0	20	30	35.29	2.4108	−19	11	56.8	+11.945
1	20	32	59.76	2.4048	18	59	56.6	12.060
2	20	35	23.86	2.3987	18	47	49.6	12.174
3	20	37	47.60	2.3927	18	35	35.7	12.288
4	20	40	10.98	2.3866	18	23	15.1	12.398
5	20	42	33.99	2.3806	18	10	48.0	12.506
6	20	44	56.65	2.3747	17	58	14.4	12.613
7	20	47	18.95	2.3686	17	45	34.4	12.719
8	20	49	40.88	2.3626	17	32	48.1	12.823
9	20	52	2.46	2.3567	17	19	55.7	12.923
10	20	54	23.68	2.3507	17	6	57.3	13.023
11	20	56	44.54	2.3448	16	53	52.9	13.122
12	20	59	5.05	2.3388	16	40	42.7	13.218
13	21	1	25.20	2.3329	16	27	26.8	13.312
14	21	3	45.00	2.3271	16	14	5.3	13.404
15	21	6	4.45	2.3213	16	0	38.3	13.495
16	21	8	23.55	2.3154	15	47	5.9	13.584
17	21	10	42.30	2.3096	15	33	28.2	13.671
18	21	13	0.70	2.3038	15	19	45.4	13.756
19	21	15	18.76	2.2981	15	5	57.5	13.840
20	21	17	36.47	2.2924	14	52	4.6	13.922
21	21	19	53.85	2.2868	14	38	6.9	14.001
22	21	22	10.89	2.2813	14	24	4.5	14.078
23	21	24	27.60	2.2757	−14	9	57.5	+14.154

MARCH 2.

Hour.	Right Ascension.			Var. per Min.	Declination.			Var. per Min.
	h	m	s	s	°	′	″	″
0	21	26	43.97	2.2701	−13	55	46.0	+14.228
1	21	29	0.01	2.2647	13	41	30.1	14.301
2	21	31	15.73	2.2593	13	27	9.9	14.372
3	21	33	31.13	2.2539	13	12	45.5	14.441
4	21	35	46.20	2.2486	12	58	17.0	14.508
5	21	38	0.96	2.2433	12	43	44.6	14.573
6	21	40	15.40	2.2381	12	29	8.3	14.637
7	21	42	29.53	2.2329	12	14	28.2	14.698
8	21	44	43.35	2.2278	11	59	44.5	14.758
9	21	46	56.86	2.2227	11	44	57.3	14.816
10	21	49	10.07	2.2177	11	30	6.6	14.873
11	21	51	22.98	2.2127	11	15	12.6	14.927
12	21	53	35.59	2.2078	11	0	15.4	14.979
13	21	55	47.91	2.2030	10	45	15.1	15.030
14	21	57	59.95	2.1983	10	30	11.8	15.079
15	22	0	11.70	2.1935	10	15	5.6	15.127
16	22	2	23.17	2.1888	9	59	56.6	15.173
17	22	4	34.36	2.1843	9	44	44.9	15.216
18	22	6	45.28	2.1798	9	29	30.7	15.258
19	22	8	55.93	2.1753	9	14	13.9	15.300
20	22	11	6.31	2.1708	8	58	54.7	15.338
21	22	13	16.43	2.1665	8	43	33.3	15.375
22	22	15	26.29	2.1623	8	28	9.7	15.411
23	22	17	35.90	2.1580	8	12	44.0	15.445
24	*22*	*19*	*45.25*	*2.1538*	*− 7*	*57*	*16.3*	*+15.477*

MARCH 3.

Hour.	Right Ascension.			Var. per Min.	Declination.			Var. per Min.
	h	m	s	s	°	′	″	″
0	22	19	45.25	2.1538	−7	57	16.3	+15.477
1	22	21	54.36	2.1498	7	41	46.8	15.507
2	22	24	3.22	2.1458	7	26	15.5	15.536
3	22	26	11.85	2.1418	7	10	42.5	15.563
4	22	28	20.24	2.1380	6	55	7.9	15.588
5	22	30	28.41	2.1343	6	39	31.9	15.612
6	22	32	36.35	2.1304	6	23	54.5	15.634
7	22	34	44.06	2.1268	6	8	15.8	15.654
8	22	36	51.56	2.1232	5	52	36.0	15.673
9	22	38	58.84	2.1196	5	36	55.0	15.692
10	22	41	5.91	2.1162	5	21	13.0	15.708
11	22	43	12.78	2.1128	5	5	30.1	15.721
12	22	45	19.44	2.1094	4	49	46.5	15.733
13	22	47	25.91	2.1062	4	34	2.2	15.744
14	22	49	32.18	2.1030	4	18	17.2	15.754
15	22	51	38.27	2.1000	4	2	31.7	15.762
16	22	53	44.18	2.0969	3	46	45.8	15.768
17	22	55	49.90	2.0939	3	30	59.5	15.773
18	22	57	55.45	2.0910	3	15	13.0	15.776
19	23	0	0.82	2.0882	2	59	26.4	15.778
20	23	2	6.03	2.0855	2	43	39.7	15.778
21	23	4	11.08	2.0828	2	27	53.0	15.778
22	23	6	15.97	2.0802	2	12	6.4	15.775
23	23	8	20.70	2.0776	−1	56	20.0	+15.771

MARCH 4.

Hour.	Right Ascension.			Var. per Min.	Declination.			Var. per Min.
	h	m	s	s	°	′	″	″
0	23	10	25.28	2.0752	−1	40	33.9	+15.765
1	23	12	29.72	2.0728	1	24	48.2	15.758
2	23	14	34.01	2.0704	1	9	3.0	15.749
3	23	16	38.17	2.0683	0	53	18.3	15.740
4	23	18	42.20	2.0661	0	37	34.2	15.728
5	23	20	46.10	2.0639	0	21	50.9	15.715
6	23	22	49.87	2.0618	−0	6	8.4	15.701
7	23	24	53.52	2.0598	+0	9	33.2	15.686
8	23	26	57.05	2.0580	0	25	13.9	15.669
9	23	29	0.48	2.0563	0	40	53.5	15.651
10	23	31	3.80	2.0544	0	56	32.0	15.631
11	23	33	7.01	2.0527	1	12	9.2	15.610
12	23	35	10.12	2.0511	1	27	45.2	15.588
13	23	37	13.14	2.0496	1	43	19.8	15.564
14	23	39	16.07	2.0481	1	58	52.9	15.539
15	23	41	18.91	2.0467	2	14	24.5	15.513
16	23	43	21.67	2.0453	2	29	54.4	15.484
17	23	45	24.35	2.0441	2	45	22.6	15.456
18	23	47	26.96	2.0428	3	0	49.1	15.427
19	23	49	29.49	2.0417	3	16	13.8	15.395
20	23	51	31.96	2.0406	3	31	36.5	15.362
21	23	53	34.36	2.0396	3	46	57.2	15.328
22	23	55	36.71	2.0387	4	2	15.8	15.293
23	23	57	39.00	2.0378	4	17	32.3	15.257
24	23	59	41.25	2.0371	+4	32	46.8	+15.219

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GREENWICH MEAN TIME.

Hour.	Right Ascension.			Var. per Min.	Declination.			Var. per Min.
				MARCH 5.				
	h	m	s	s	°	′	″	″
0	23	59	41.25	2.0371	+ 4	32	46.6	+15.219
1	0	1	43.45	2.0363	4	47	58.6	15.180
2	0	3	45.60	2.0355	5	3	8.2	15.140
3	0	5	47.71	2.0349	5	18	15.4	15.098
4	0	7	49.79	2.0344	5	33	20.0	15.055
5	0	9	51.84	2.0339	5	48	22.0	15.012
6	0	11	53.86	2.0335	6	3	21.4	14.968
7	0	13	55.86	2.0332	6	18	18.1	14.922
8	0	15	57.84	2.0328	6	33	12.0	14.874
9	0	17	59.80	2.0326	6	48	3.0	14.826
10	0	20	1.75	2.0324	7	2	51.1	14.777
11	0	22	3.69	2.0323	7	17	36.2	14.726
12	0	24	5.62	2.0322	7	32	18.2	14.674
13	0	26	7.55	2.0322	7	46	57.1	14.622
14	0	28	9.48	2.0323	8	1	32.8	14.568
15	0	30	11.42	2.0324	8	16	5.2	14.512
16	0	32	13.37	2.0326	8	30	34.2	14.456
17	0	34	15.33	2.0328	8	44	59.9	14.399
18	0	36	17.30	2.0331	8	59	22.1	14.341
19	0	38	19.30	2.0335	9	13	40.8	14.282
20	0	40	21.32	2.0338	9	27	55.9	14.222
21	0	42	23.36	2.0343	9	42	7.4	14.160
22	0	44	25.43	2.0348	9	56	15.1	14.098
23	0	46	27.54	2.0354	+10	10	19.1	+14.034
				MARCH 6.				
0	0	48	29.68	2.0360	+10	24	19.2	+13.969
1	0	50	31.86	2.0367	10	38	15.4	13.904
2	0	52	34.08	2.0373	10	52	7.7	13.838
3	0	54	36.34	2.0381	11	5	56.0	13.771
4	0	56	38.65	2.0389	11	19	40.2	13.703
5	0	58	41.01	2.0398	11	33	20.3	13.633
6	1	0	43.43	2.0408	11	46	56.1	13.562
7	1	2	45.90	2.0417	12	0	27.7	13.491
8	1	4	48.43	2.0427	12	13	55.0	13.419
9	1	6	51.02	2.0438	12	27	18.0	13.346
10	1	8	53.68	2.0448	12	40	36.5	13.271
11	1	10	56.40	2.0460	12	53	50.5	13.196
12	1	12	59.20	2.0473	13	7	0.0	13.120
13	1	15	2.07	2.0484	13	20	4.9	13.043
14	1	17	5.01	2.0497	13	33	5.2	12.966
15	1	19	8.03	2.0510	13	46	0.8	12.887
16	1	21	11.13	2.0524	13	58	51.6	12.807
17	1	23	14.32	2.0538	14	11	37.6	12.727
18	1	25	17.59	2.0553	14	24	18.8	12.645
19	1	27	20.95	2.0568	14	36	55.0	12.563
20	1	29	24.40	2.0583	14	49	26.3	12.480
21	1	31	27.94	2.0598	15	1	52.6	12.396
22	1	33	31.57	2.0613	15	14	13.8	12.311
23	1	35	35.30	2.0629	15	26	29.9	12.226
24	*1*	*37*	*39.12*	*2.0645*	*+15*	*38*	*40.9*	+12.139

Hour.	Right Ascension.			Var. per Min.	Declination.		
				MARCH 7.			
	h	m	s	s	°	′	″
0	1	37	39.12	2.0645	+15	38	40.9
1	1	39	43.04	2.0663	15	50	46.6
2	1	41	47.07	2.0680	16	2	47.1
3	1	43	51.20	2.0698	16	14	42.2
4	1	45	55.44	2.0716	16	26	32.0
5	1	47	59.79	2.0733	16	38	16.4
6	1	50	4.24	2.0752	16	49	55.3
7	1	52	8.81	2.0771	17	1	28.7
8	1	54	13.49	2.0789	17	12	56.6
9	1	56	18.28	2.0808	17	24	18.9
10	1	58	23.19	2.0828	17	35	35.6
11	2	0	28.21	2.0847	17	46	46.5
12	2	2	33.35	2.0867	17	57	51.7
13	2	4	38.61	2.0887	18	8	51.1
14	2	6	43.99	2.0907	18	19	44.7
15	2	8	49.49	2.0928	18	30	32.5
16	2	10	55.12	2.0948	18	41	14.3
17	2	13	0.87	2.0968	18	51	50.2
18	2	15	6.74	2.0989	19	2	20.1
19	2	17	12.74	2.1011	19	12	43.9
20	2	19	18.87	2.1033	19	23	1.7
21	2	21	25.13	2.1053	19	33	13.4
22	2	23	31.51	2.1074	19	43	18.9
23	2	25	38.02	2.1096	+19	53	18.2
				MARCH 8.			
0	2	27	44.66	2.1118	+20	3	11.2
1	2	29	51.43	2.1138	20	12	58.0
2	2	31	58.32	2.1160	20	22	38.4
3	2	34	5.35	2.1183	20	32	12.5
4	2	36	12.51	2.1204	20	41	40.2
5	2	38	19.80	2 1226	20	51	1.4
6	2	40	27.22	2.1248	21	0	16.2
7	2	42	34.77	2.1269	21	9	24.5
8	2	44	42.45	2.1292	21	18	26.2
9	2	46	50.27	2.1313	21	27	21.4
10	2	48	58.21	2.1335	21	36	9.9
11	2	51	6.29	2.1358	21	44	51.8
12	2	53	14.50	2.1379	21	53	27.0
13	2	55	22.84	2.1400	22	1	55.5
14	2	57	31.30	2.1421	22	10	17.2
15	2	59	39.89	2.1443	22	18	32.1
16	3	1	48.62	2.1465	22	26	40.2
17	3	3	57.47	2.1486	22	34	41.5
18	3	6	6.45	2.1507	22	42	35.9
19	3	8	15.55	2.1528	22	50	23.4
20	3	10	24.78	2.1549	22	58	3.9
21	3	12	34.14	2.1570	23	5	37.4
22	3	14	43.62	2.1590	23	13	3.9
23	3	16	53.22	2.1610	23	20	23.4
24	3	19	2.94	2.1630	+23	27	35.8

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	MARCH 9.					MARCH 11.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	3 19 2.94	2.1630	+23 27 35.8	+7.148	0	5 4 34.77	2.2174	+26 47 49.2	+1.101
1	3 21 12.78	2.1650	23 34 41.1	7.029	1	5 6 47.81	2.2173	26 48 51.4	0.972
2	3 23 22.74	2.1670	23 41 39.3	6.910	2	5 9 0.85	2.2173	26 49 45.8	0.841
3	3 25 32.82	2.1690	23 48 30.3	6.791	3	5 11 13.88	2.2171	26 50 32.3	0.711
4	3 27 43.02	2.1709	23 55 14.2	6.672	4	5 13 26.90	2.2168	26 51 11.1	0.582
5	3 29 53.33	2.1728	24 1 50.9	6.551	5	5 15 39.90	2.2165	26 51 42.1	0.453
6	3 32 3.75	2.1747	24 8 20.3	6.430	6	5 17 52.88	2.2162	26 52 5.4	0.323
7	3 34 14.29	2.1765	24 14 42.5	6.309	7	5 20 5.84	2.2158	26 52 20.8	0.192
8	3 36 24.93	2.1783	24 20 57.4	6.188	8	5 22 18.78	2.2154	26 52 28.4	+0.063
9	3 38 35.69	2.1802	24 27 5.0	6.066	9	5 24 31.69	2.2148	26 52 28.3	−0.067
10	3 40 46.55	2.1818	24 33 5.3	5.943	10	5 26 44.56	2.2143	26 52 20.4	0.196
11	3 42 57.51	2.1836	24 38 58.2	5.820	11	5 28 57.40	2.2136	26 52 4.8	0.325
12	3 45 8.58	2.1853	24 44 43.7	5.698	12	5 31 10.19	2.2128	26 51 41.4	0.455
13	3 47 19.75	2.1870	24 50 21.9	5.574	13	5 33 22.94	2.2122	26 51 10.2	0.584
14	3 49 31.02	2.1886	24 55 52.6	5.450	14	5 35 35.65	2.2114	26 50 31.3	0.713
15	3 51 42.38	2.1902	25 1 15.9	5.326	15	5 37 48.31	2.2106	26 49 44.7	0.841
16	3 53 53.84	2.1918	25 6 31.7	5.202	16	5 40 0.92	2.2097	26 48 50.4	0.970
17	3 56 5.40	2.1933	25 11 40.1	5.078	17	5 42 13.47	2.2087	26 47 48.3	1.098
18	3 58 17.04	2.1948	25 16 41.0	4.952	18	5 44 25.96	2.2077	26 46 38.6	1.226
19	4 0 28.77	2.1962	25 21 34.3	4.826	19	5 46 38.39	2.2066	26 45 21.2	1.354
20	4 2 40.58	2.1975	25 26 20.1	4.701	20	5 48 50.75	2.2054	26 43 56.1	1.483
21	4 4 52.47	2.1989	25 30 58.4	4.575	21	5 51 3.04	2.2043	26 42 23.3	1.610
22	4 7 4.45	2.2003	25 35 29.1	4.448	22	5 53 15.26	2.2031	26 40 42.9	1.738
23	4 9 16.50	2.2015	+25 39 52.2	+4.322	23	5 55 27.41	2.2018	+26 38 54.8	−1.865
	MARCH 10.					MARCH 12.			
0	4 11 28.63	2.2028	+25 44 7.7	+4.195	0	5 57 39.48	2.2005	+26 36 59.1	−1.992
1	4 13 40.83	2.2039	25 48 15.6	4.068	1	5 59 51.47	2.1991	26 34 55.8	2.118
2	4 15 53.10	2.2051	25 52 15.8	3.940	2	6 2 3.37	2.1977	26 32 44.9	2.244
3	4 18 5.44	2.2063	25 56 8.4	3.813	3	6 4 15.19	2.1962	26 30 26.5	2.370
4	4 20 17.85	2.2073	25 59 53.4	3.686	4	6 6 26.91	2.1946	26 28 0.5	2.497
5	4 22 30.31	2.2082	26 3 30.7	3.558	5	6 8 38.54	2.1931	26 25 26.9	2.623
6	4 24 42.83	2.2092	26 7 0.3	3.429	6	6 10 50.08	2.1914	26 22 45.8	2.748
7	4 26 55.41	2.2101	26 10 22.2	3.301	7	6 13 1.51	2.1897	26 19 57.2	2.873
8	4 29 8.04	2.2110	26 13 36.4	3.173	8	6 15 12.84	2.1880	26 17 1.1	2.998
9	4 31 20.73	2.2118	26 16 42.9	3.043	9	6 17 24.07	2.1863	26 13 57.5	3.122
10	4 33 33.46	2.2125	26 19 41.6	2.914	10	6 19 35.19	2.1844	26 10 46.5	3.245
11	4 35 46.23	2.2132	26 22 32.6	2.786	11	6 21 46.20	2.1826	26 7 28.1	3.369
12	4 37 59.04	2.2138	26 25 15.9	2.657	12	6 23 57.10	2.1807	26 4 2.2	3.493
13	4 40 11.89	2.2144	26 27 51.4	2.528	13	6 26 7.88	2.1788	26 0 28.9	3.616
14	4 42 24.77	2.2150	26 30 19.2	2.398	14	6 28 18.55	2.1768	25 56 48.3	3.738
15	4 44 37.69	2.2155	26 32 39.2	2.268	15	6 30 29.09	2.1747	25 53 0.3	3.861
16	4 46 50.63	2.2158	26 34 51.4	2.139	16	6 32 39.51	2.1727	25 49 5.0	3.983
17	4 49 3.59	2.2163	26 36 55.9	2.010	17	6 34 49.81	2.1706	25 45 2.4	4.103
18	4 51 16.58	2.2167	26 38 52.6	1.880	18	6 36 59.98	2.1684	25 40 52.6	4.224
19	4 53 29.59	2.2169	26 40 41.5	1.750	19	6 39 10.02	2.1663	25 36 35.5	4.346
20	4 55 42.61	2.2171	26 42 22.6	1.620	20	6 41 19.93	2.1640	25 32 11.1	4.467
21	4 57 55.64	2.2173	26 43 55.9	1.491	21	6 43 29.70	2.1618	25 27 39.5	4.586
22	5 0 8.68	2.2173	26 45 21.5	1.362	22	6 45 39.34	2.1595	25 23 0.8	4.705
23	5 2 21.72	2.2174	26 46 39.3	1.231	23	6 47 48.84	2.1572	25 18 14.9	4.824
24	*5 4 34.77*	*2.2174*	*+26 47 49.2*	*+1.101*	24	6 49 58.20	2.1548	+25 13 21.9	−4.9

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Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	MARCH 13.					MARCH 15.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	6 49 58.20	2.1548	+25 13 21.9	−4.943	0	8 30 20.52	2.0253	+19 9 27.9	− 9.994
1	6 52 7.42	2.1525	25 8 21.8	5.061	1	8 32 21.96	2.0228	18 59 25.5	10.084
2	6 54 16.50	2.1501	25 3 14.6	5.178	2	8 34 23.25	2.0203	18 49 17.8	10.173
3	6 56 25.43	2.1476	24 58 0.4	5.296	3	8 36 24.39	2.0177	18 39 4.7	10.262
4	6 58 34.21	2.1451	24 52 39.1	5.413	4	8 38 25.37	2.0151	18 28 46.4	10.349
5	7 0 42.84	2.1427	24 47 10.9	5.528	5	8 40 26.20	2.0126	18 18 22.8	10.437
6	7 2 51.33	2.1402	24 41 35.7	5.644	6	8 42 26.88	2.0101	18 7 54.0	10.523
7	7 4 59.66	2.1376	24 35 53.6	5.760	7	8 44 27.41	2.0076	17 57 20.0	10.609
8	7 7 7.84	2.1350	24 30 4.5	5.875	8	8 46 27.79	2.0052	17 46 40.9	10.694
9	7 9 15.86	2.1324	24 24 8.6	5.988	9	8 48 28.03	2.0028	17 35 56.7	10.778
10	7 11 23.73	2.1298	24 18 5.9	6.103	10	8 50 28.13	2.0004	17 25 7.5	10.862
11	7 13 31.44	2.1272	24 11 56.3	6.216	11	8 52 28.08	1.9980	17 14 13.3	10.945
12	7 15 38.99	2.1245	24 5 40.0	6.328	12	8 54 27.89	1.9957	17 3 14.1	11.028
13	7 17 46.38	2.1218	23 59 17.0	6.440	13	8 56 27.56	1.9934	16 52 10.0	11.108
14	7 19 53.61	2.1192	23 52 47.2	6.553	14	8 58 27.10	1.9912	16 41 1.1	11.188
15	7 22 0.68	2.1165	23 46 10.7	6.663	15	9 0 26.50	1.9889	16 29 47.4	11.268
16	7 24 7.59	2.1138	23 39 27.6	6.773	16	9 2 25.77	1.9868	16 18 28.9	11.348
17	7 26 14.33	2.1110	23 32 37.9	6.883	17	9 4 24.91	1.9846	16 7 5.6	11.427
18	7 28 20.91	2.1083	23 25 41.6	6.993	18	9 6 23.92	1.9824	15 55 37.7	11.504
19	7 30 27.32	2.1055	23 18 38.7	7.103	19	9 8 22.80	1.9803	15 44 5.1	11.581
20	7 32 33.57	2.1028	23 11 29.3	7.210	20	9 10 21.56	1.9783	15 32 28.0	11.657
21	7 34 39.65	2.0999	23 4 13.5	7.318	21	9 12 20.20	1.9763	15 20 46.3	11.733
22	7 36 45.56	2.0971	22 56 51.2	7.425	22	9 14 18.72	1.9743	15 9 0.1	11.807
23	7 38 51.30	2.0943	+22 49 22.5	−7.532	23	9 16 17.12	1.9723	+14 57 9.5	−11.881
	MARCH 14.					MARCH 16.			
0	7 40 56.88	2.0916	+22 41 47.4	−7.638	0	9 18 15.40	1.9704	+14 45 14.4	−11.954
1	7 43 2.29	2.0888	22 34 6.0	7.743	1	9 20 13.57	1.9686	14 33 15.0	12.027
2	7 45 7.53	2.0859	22 26 18.3	7.848	2	9 22 11.63	1.9668	14 21 11.2	12.098
3	7 47 12.60	2.0831	22 18 24.3	7.953	3	9 24 9.58	1.9650	14 9 3.2	12.169
4	7 49 17.50	2.0803	22 10 24.0	8.057	4	9 26 7.43	1.9633	13 56 50.9	12.239
5	7 51 22.24	2.0776	22 2 17.5	8.159	5	9 28 5.17	1.9615	13 44 34.5	12.308
6	7 53 26.81	2.0747	21 54 4.9	8.261	6	9 30 2.81	1.9599	13 32 13.9	12.377
7	7 55 31.20	2.0718	21 45 46.2	8.363	7	9 32 0.36	1.9583	13 19 49.3	12.444
8	7 57 35.43	2.0691	21 37 21.4	8.464	8	9 33 57.81	1.9568	13 7 20.6	12.511
9	7 59 39.49	2.0663	21 28 50.5	8.565	9	9 35 55.17	1.9552	12 54 48.0	12.577
10	8 1 43.38	2.0635	21 20 13.6	8.664	10	9 37 52.43	1.9537	12 42 11.4	12.643
11	8 3 47.11	2.0608	21 11 30.8	8.763	11	9 39 49.61	1.9523	12 29 30.9	12.707
12	8 5 50.67	2.0579	21 2 42.0	8.863	12	9 41 46.70	1.9508	12 16 46.6	12.770
13	8 7 54.06	2.0551	20 53 47.3	8.960	13	9 43 43.71	1.9496	12 3 58.5	12.833
14	8 9 57.28	2.0523	20 44 46.8	9.058	14	9 45 40.65	1.9483	11 51 6.6	12.895
15	8 12 0.34	2.0496	20 35 40.4	9.154	15	9 47 37.51	1.9471	11 38 11.1	12.956
16	8 14 3.23	2.0468	20 26 28.3	9.250	16	9 49 34.30	1.9459	11 25 11.9	13.017
17	8 16 5.96	2.0441	20 17 10.4	9.346	17	9 51 31.02	1.9448	11 12 9.1	13.077
18	8 18 8.52	2.0413	20 7 46.8	9.440	18	9 53 27.67	1.9436	10 59 2.7	13.135
19	8 20 10.92	2.0387	19 58 17.6	9.534	19	9 55 24.25	1.9426	10 45 52.9	13.192
20	8 22 13.16	2.0360	19 48 42.7	9.628	20	9 57 20.78	1.9417	10 32 39.7	13.249
21	8 24 15.24	2.0333	19 39 2.3	9.720	21	9 59 17.25	1.9407	10 19 23.0	13.306
22	8 26 17.16	2.0307	19 29 16.3	9.813	22	10 1 13.66	1.9398	10 6 3.0	13.361
23	8 28 18.92	2.0280	19 19 24.8	9.903	23	10 3 10.02	1.9389	9 52 39.7	13.415
24	8 30 20.52	2.0253	+19 9 27.9	−9.994	24	10 5 6.33	1.9382	+ 9 39 13.2	−13.468

GREENWICH MEAN TIME.

MARCH 17.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	h m s	s	° ′ ″	″
0	10 5 6.33	1.9382	+9 39 13.2	−13.468
1	10 7 2.60	1.9375	9 25 43.5	13.521
2	10 8 58.83	1.9368	9 12 10.7	13.573
3	10 10 55.02	1.9362	8 58 34.8	13.624
4	10 12 51.17	1.9356	8 44 55.8	13.674
5	10 14 47.29	1.9352	8 31 13.9	13.723
6	10 16 43.39	1.9348	8 17 29.1	13.771
7	10 18 39.46	1.9343	8 3 41.4	13.818
8	10 20 35.51	1.9340	7 49 50.9	13.865
9	10 22 31.54	1.9337	7 35 57.6	13.910
10	10 24 27.55	1.9335	7 22 1.7	13.954
11	10 26 23.56	1.9334	7 8 3.1	13.998
12	10 28 19.56	1.9333	6 54 1.9	14.041
13	10 30 15.56	1.9333	6 39 58.2	14.083
14	10 32 11.55	1.9333	6 25 52.0	14.123
15	10 34 7.55	1.9333	6 11 43.4	14.163
16	10 36 3.55	1.9334	5 57 32.4	14.203
17	10 37 59.56	1.9337	5 43 19.1	14.241
18	10 39 55.59	1.9340	5 29 3.5	14.278
19	10 41 51.64	1.9343	5 14 45.8	14.313
20	10 43 47.71	1.9347	5 0 26.0	14.348
21	10 45 43.80	1.9351	4 46 4.0	14.383
22	10 47 39.92	1.9357	4 31 40.1	14.415
23	10 49 36.08	1.9363	+4 17 14.2	−14.448

MARCH 18.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
0	10 51 32.27	1.9368	+4 2 46.4	−14.478
1	10 53 28.50	1.9376	3 48 16.8	14.508
2	10 55 24.78	1.9384	3 33 45.4	14.538
3	10 57 21.11	1.9393	3 19 12.3	14.566
4	10 59 17.49	1.9401	3 4 37.5	14.593
5	11 1 13.92	1.9411	2 50 1.2	14.618
6	11 3 10.42	1.9422	2 35 23.3	14.644
7	11 5 6.98	1.9432	2 20 43.9	14.668
8	11 7 3.60	1.9443	2 6 3.2	14.690
9	11 9 0.30	1.9457	1 51 21.1	14.713
10	11 10 57.08	1.9469	1 36 37.7	14.733
11	11 12 53.93	1.9483	1 21 53.1	14.753
12	11 14 50.87	1.9498	1 7 7.4	14.771
13	11 16 47.90	1.9513	0 52 20.6	14.788
14	11 18 45.02	1.9528	0 37 32.8	14.805
15	11 20 42.23	1.9543	0 22 44.0	14.820
16	11 22 39.54	1.9561	+0 7 54.4	14.833
17	11 24 36.96	1.9579	−0 6 56.0	14.847
18	11 26 34.49	1.9598	0 21 47.2	14.859
19	11 28 32.13	1.9617	0 36 39.1	14.870
20	11 30 29.89	1.9636	0 51 31.6	14.880
21	11 32 27.76	1.9656	1 6 24.7	14.888
22	11 34 25.76	1.9678	1 21 18.2	14.895
23	11 36 23.89	1.9699	1 36 12.1	14.902
24	11 38 22.15	1.9722	*−1 51 6.4*	−14.907

MARCH 19.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	h m s	s	° ′ ″	″
0	11 38 22.15	1.9722	− 1 51 6.4	−14.907
1	11 40 20.55	1.9745	2 6 0.9	14.910
2	11 42 19.09	1.9768	2 20 55.6	14.913
3	11 44 17.77	1.9793	2 35 50.5	14.915
4	11 46 16.60	1.9818	2 50 45.4	14.915
5	11 48 15.59	1.9844	3 5 40.3	14.913
6	11 50 14.73	1.9871	3 20 35.0	14.911
7	11 52 14.04	1.9898	3 35 29.6	14.908
8	11 54 13.51	1.9926	3 50 24.0	14.904
9	11 56 13.15	1.9955	4 5 18.1	14.898
10	11 58 12.97	1.9984	4 20 12.8	14.891
11	12 0 12.96	2.0014	4 35 5.0	14.883
12	12 2 13.14	2.0045	4 49 57.7	14.873
13	12 4 13.50	2.0076	5 4 49.8	14.862
14	12 6 14.05	2.0108	5 19 41.1	14.849
15	12 8 14.80	2.0142	5 34 31.7	14.836
16	12 10 15.75	2.0175	5 49 21.4	14.821
17	12 12 16.90	2.0209	6 4 10.2	14.805
18	12 14 18.26	2.0244	6 18 58.0	14.788
19	12 16 19.83	2.0279	6 33 44.7	14.769
20	12 18 21.61	2.0316	6 48 30.3	14.749
21	12 20 23.62	2.0353	7 3 14.6	14.728
22	12 22 25.85	2.0391	7 17 57.6	14.705
23	12 24 28.31	2.0429	− 7 32 39.2	−14.681

MARCH 20.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
0	12 26 31.00	2.0468	− 7 47 19.3	−14.655
1	12 28 33.92	2.0508	8 1 57.8	14.628
2	12 30 37.09	2.0548	8 16 34.7	14.600
3	12 32 40.50	2.0589	8 31 9.8	14.571
4	12 34 44.16	2.0631	8 45 43.2	14.540
5	12 36 48.07	2.0673	9 0 14.6	14.507
6	12 38 52.24	2.0716	9 14 44.0	14.473
7	12 40 56.66	2.0759	9 29 11.4	14.438
8	12 43 1.35	2.0804	9 43 36.6	14.401
9	12 45 6.31	2.0849	9 57 59.5	14.363
10	12 47 11.54	2.0894	10 12 20.1	14.324
11	12 49 17.04	2.0940	10 26 38.4	14.283
12	12 51 22.82	2.0987	10 40 54.1	14.240
13	12 53 28.88	2.1034	10 55 7.2	14.196
14	12 55 35.23	2.1083	11 9 17.6	14.151
15	12 57 41.87	2.1132	11 23 25.3	14.104
16	12 59 48.81	2.1181	11 37 30.1	14.056
17	13 1 56.04	2.1230	11 51 32.0	14.006
18	13 4 3.57	2.1281	12 5 30.8	13.954
19	13 6 11.41	2.1333	12 19 26.5	13.901
20	13 8 19.56	2.1383	12 33 18.9	13.847
21	13 10 28.01	2.1434	12 47 8.1	13.792
22	13 12 36.77	2.1488	13 0 53.9	13.734
23	13 14 45.86	2.1542	13 14 36.2	13.675
24	13 16 55.27	2.1595	−13 28 14.9	−13.614

MOON, 1916.

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	MARCH 21.			
	h m s	s	° ′ ″	″
0	13 16 55.27	2.1595	−13 28 14.9	−13.614
1	13 19 5.00	2.1649	13 41 49.9	13.552
2	13 21 15.06	2.1704	13 55 21.1	13.488
3	13 23 25.45	2.1759	14 8 48.5	13.423
4	13 25 36.17	2.1814	14 22 11.9	13.357
5	13 27 47.22	2.1671	14 35 31.3	13.288
6	13 29 58.62	2.1928	14 48 46.5	13.218
7	13 32 10.36	2.1986	15 1 57.5	13.147
8	13 34 22.45	2.2043	15 15 4.1	13.073
9	13 36 34.88	2.2101	15 28 6.3	12.999
10	13 38 47.66	2.2159	15 41 4.0	12.923
11	13 41 0.79	2.2218	15 53 57.1	12.845
12	13 43 14.28	2.2278	16 6 45.4	12.765
13	13 45 28.12	2.2337	16 19 28.9	12.684
14	13 47 42.32	2.2398	16 32 7.5	12.602
15	13 49 56.89	2.2458	16 44 41.1	12.518
16	13 52 11.82	2.2518	16 57 9.6	12.431
17	13 54 27.11	2.2579	17 9 32.8	12.343
18	13 56 42.77	2.2640	17 21 50.8	12.255
19	13 58 58.79	2.2702	17 34 3.4	12.164
20	14 1 15.19	2.2764	17 46 10.5	12.072
21	14 3 31.96	2.2826	17 58 12.0	11.978
22	14 5 49.10	2.2888	18 10 7.8	11.882
23	14 8 6.62	2.2951	−18 21 57.8	−11.784
	MARCH 22.			
0	14 10 24.51	2.3013	−18 33 41.9	−11.685
1	14 12 42.78	2.3077	18 45 20.0	11.585
2	14 15 1.43	2.3139	18 56 52.1	11.483
3	14 17 20.45	2.3202	19 8 18.0	11.378
4	14 19 39.85	2.3266	19 19 37.5	11.273
5	14 21 59.64	2.3329	19 30 50.7	11.166
6	14 24 19.80	2.3392	19 41 57.4	11.058
7	14 26 40.34	2.3455	19 52 57.6	10.948
8	14 29 1.26	2.3519	20 3 51.1	10.836
9	14 31 22.57	2.3583	20 14 37.9	10.723
10	14 33 44.26	2.3646	20 25 17.8	10.607
11	14 36 6.32	2.3708	20 35 50.7	10.490
12	14 38 28.76	2.3772	20 46 16.6	10.372
13	14 40 51.58	2.3835	20 56 35.3	10.252
14	14 43 14.78	2.3898	21 6 46.8	10.131
15	14 45 38.36	2.3961	21 16 51.0	10.008
16	14 48 2.31	2.4023	21 26 47.7	9.883
17	14 50 26.64	2.4086	21 36 36.9	9.757
18	14 52 51.34	2.4148	21 46 18.5	9.629
19	14 55 16.42	2.4210	21 55 52.4	9.499
20	14 57 41.86	2.4272	22 5 18.4	9.368
21	15 0 7.68	2.4333	22 14 36.6	9.237
22	15 2 33.86	2.4393	22 23 46.8	9.103
23	15 5 0.40	2.4454	22 32 48.9	8.967
24	*15 7 27.31*	*2.4515*	−22 41 42.8	− 8.830

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	MARCH 23.			
	h m s	s	° ′ ″	″
0	15 7 27.31	2.4515	−22 41 42.8	−8.830
1	15 9 54.58	2.4574	22 50 28.5	8.692
2	15 12 22.20	2.4633	22 59 5.8	8.552
3	15 14 50.18	2.4693	23 7 34.7	8.410
4	15 17 18.51	2.4751	23 15 55.0	8.267
5	15 19 47.19	2.4808	23 24 6.7	8.123
6	15 22 16.21	2.4866	23 32 9.8	7.978
7	15 24 45.58	2.4923	23 40 4.1	7.831
8	15 27 15.28	2.4978	23 47 49.5	7.682
9	15 29 45.31	2.5033	23 55 25.9	7.533
10	15 32 15.68	2.5088	24 2 53.4	7.382
11	15 34 46.37	2.5142	24 10 11.7	7.229
12	15 37 17.38	2.5194	24 17 20.9	7.076
13	15 39 48.70	2.5247	24 24 20.8	6.921
14	15 42 20.34	2.5299	24 31 11.4	6.764
15	15 44 52.29	2.5349	24 37 52.5	6.606
16	15 47 24.53	2.5398	24 44 24.1	6.448
17	15 49 57.07	2.5448	24 50 46.2	6.288
18	15 52 29.90	2.5496	24 56 58.6	6.127
19	15 55 3.02	2.5543	25 3 1.4	5.965
20	15 57 36.41	2.5588	25 8 54.4	5.802
21	16 0 10.08	2.5633	25 14 37.6	5.638
22	16 2 44.01	2.5677	25 20 10.9	5.472
23	16 5 18.20	2.5720	−25 25 34.2	−5.305
	MARCH 24.			
0	16 7 52.65	2.5762	−25 30 47.5	−5.138
1	16 10 27.34	2.5803	25 35 50.7	4.968
2	16 13 2.28	2.5843	25 40 43.7	4.798
3	16 15 37.45	2.5880	25 45 26.5	4.628
4	16 18 12.84	2.5918	25 49 59.1	4.457
5	16 20 48.46	2.5953	25 54 21.3	4.284
6	16 23 24.28	2.5988	25 58 33.2	4.112
7	16 26 0.31	2.6022	26 2 34.7	3.938
8	16 28 36.54	2.6054	26 6 25.7	3.763
9	16 31 12.96	2.6085	26 10 6.2	3.588
10	16 33 49.56	2.6115	26 13 36.2	3.411
11	16 36 26.34	2.6143	26 16 55.5	3.233
12	16 39 3.28	2.6170	26 20 4.2	3.056
13	16 41 40.38	2.6196	26 23 2.2	2.878
14	16 44 17.63	2.6220	26 25 49.5	2.699
15	16 46 55.02	2.6243	26 28 26.1	2.520
16	16 49 32.54	2.6263	26 30 51.9	2.339
17	16 52 10.18	2.6283	26 33 6.8	2.158
18	16 54 47.94	2.6302	26 35 10.9	1.978
19	16 57 25.80	2.6319	26 37 4.2	1.797
20	17 0 3.77	2.6335	26 38 46.5	1.615
21	17 2 41.82	2.6348	26 40 18.0	1.433
22	17 5 19.95	2.6362	26 41 38.5	1.250
23	17 7 58.16	2.6373	26 42 48.0	1.068
24	17 10 36.43	2.6383	−26 43 46.6	−0.885

GREENWICH MEAN TIME.

r.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	MARCH 25.			
	h m s	s	° ′ ″	″
	17 10 36.43	2.6383	−26 43 46.6	−0 885
	17 13 14.75	2.6390	26 44 34.2	0.702
	17 15 53.11	2.6397	26 45 10.8	0.518
	17 18 31.51	2.6402	26 45 36.3	0.334
	17 21 9.93	2.6405	26 45 50.9	−0.152
	17 23 48.37	2.6408	26 45 54.5	+0.032
	17 26 26.82	2.6408	26 45 47.1	0.216
	17 29 5.27	2.6408	26 45 28.6	0.400
	17 31 43.71	2.6405	26 44 59.1	0.583
	17 34 22.13	2.6401	26 44 18.6	0.766
	17 37 0.52	2.6395	26 43 27.2	0.949
	17 39 38.87	2.6388	26 42 24.7	1.133
	17 42 17.18	2.6380	26 41 11.2	1.317
	17 44 55.43	2.6370	26 39 46.7	1.499
	17 47 33.62	2.6359	26 38 11.3	1.681
	17 50 11.74	2.6346	26 36 25.0	1.863
	17 52 49.77	2.6331	26 34 27.7	2.046
	17 55 27.71	2.6316	26 32 19.5	2.227
	17 58 5.56	2.6299	26 30 0.5	2.408
	18 0 43.30	2.6280	26 27 30.6	2.588
	18 3 20.92	2.6260	26 24 49.9	2.768
	18 5 58.42	2.6238	26 21 58.4	2.948
	18 8 35.78	2.6216	26 18 56.2	3.127
	18 11 13.01	2.6193	−26 15 43.2	+3.306
	MARCH 26.			
	18 13 50.09	2.6167	−26 12 19.5	+3.483
	18 16 27.01	2.6139	26 8 45.2	3.661
	18 19 3.76	2.6111	26 5 0.2	3.838
	18 21 40.34	2.6082	26 1 4.7	4.013
	18 24 16.74	2.6052	25 56 58.6	4.188
	18 26 52.96	2.6020	25 52 42.1	4.362
	18 29 28.98	2.5987	25 48 15.2	4.536
	18 32 4.80	2.5953	25 43 37.8	4.709
	18 34 40.41	2.5917	25 38 50.1	4.880
	18 37 15.80	2.5880	25 33 52.2	5.051
	18 39 50.97	2.5843	25 28 44.0	5.222
	18 42 25.91	2.5804	25 23 25.6	5.391
	18 45 0.62	2.5764	25 17 57.1	5.559
	18 47 35.08	2.5723	25 12 18.5	5.726
	18 50 9.30	2.5682	25 6 30.0	5.892
	18 52 43.26	2.5638	25 0 31.5	6.057
	18 55 16.96	2.5594	24 54 23.2	6.220
	18 57 50.39	2.5549	24 48 5.1	6.383
	19 0 23.55	2.5504	24 41 37.2	6.546
	19 2 56.44	2.5458	24 34 59.6	6.706
	19 5 29.04	2.5410	24 28 12.5	6.865
	19 8 1.36	2.5363	24 21 15.8	7.024
	19 10 33.39	2.5313	24 14 9.6	7.181
	19 13 5.12	2.5263	24 6 54.1	7.337
	19 15 36.55	2.5213	−23 59 29.2	+7.492

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	MARCH 27.			
	h m s	s	° ′ ″	″
0	19 15 36.55	2.5213	−23 59 29.2	+ 7.492
1	19 18 7.67	2.5162	23 51 55.1	7.644
2	19 20 38.49	2.5110	23 44 11.9	7.796
3	19 23 8.99	2.5058	23 36 19.6	7.947
4	19 25 39.18	2.5005	23 28 18.3	8.097
5	19 28 9.05	2.4951	23 20 8.0	8.245
6	19 30 38.59	2.4897	23 11 48.9	8.391
7	19 33 7.81	2.4843	23 3 21.1	8.536
8	19 35 36.70	2.4788	22 54 44.6	8.680
9	19 38 5.26	2.4732	22 45 59.5	8.823
10	19 40 33.48	2.4675	22 37 5.9	8.963
11	19 43 1.36	2.4618	22 28 3.9	9.103
12	19 45 28.90	2.4562	22 18 53.5	9.242
13	19 47 56.10	2.4504	22 9 34.9	9.378
14	19 50 22.95	2.4447	22 0 8.1	9.514
15	19 52 49.46	2.4389	21 50 33.2	9.648
16	19 55 15.62	2.4332	21 40 50.4	9.779
17	19 57 41.44	2.4273	21 30 59.7	9.910
18	20 0 6.90	2.4214	21 21 1.2	10.040
19	20 2 32.01	2.4155	21 10 54.9	10.168
20	20 4 56.76	2.4097	21 0 41.0	10.294
21	20 7 21.17	2.4038	20 50 19.6	10.418
22	20 9 45.22	2.3978	20 39 50.8	10.542
23	20 12 8.91	2.3919	−20 29 14.6	+10.664
	MARCH 28.			
0	20 14 32.25	2.3860	−20 18 31.1	+10.784
1	20 16 55.23	2.3801	20 7 40.5	10.903
2	20 19 17.86	2.3743	19 56 42.8	11.020
3	20 21 40.14	2.3683	19 45 38.1	11.135
4	20 24 2.06	2.3623	19 34 26.6	11.248
5	20 26 23.62	2.3564	19 23 8.3	11.362
6	20 28 44.83	2.3506	19 11 43.2	11.473
7	20 31 5.69	2.3448	19 0 11.6	11.582
8	20 33 26.20	2.3388	18 48 33.4	11.690
9	20 35 46.35	2.3329	18 36 48.8	11.796
10	20 38 6.15	2.3271	18 24 57.9	11.900
11	20 40 25.60	2.3213	18 13 0.8	12.003
12	20 42 44.71	2.3155	18 0 57.6	12.103
13	20 45 3.46	2.3097	17 48 48.4	12.203
14	20 47 21.87	2.3040	17 36 33.2	12.302
15	20 49 39.94	2.2983	17 24 12.2	12.398
16	20 51 57.67	2.2926	17 11 45.5	12.493
17	20 54 15.05	2.2868	16 59 13.1	12.586
18	20 56 32.09	2.2813	16 46 35.2	12.678
19	20 58 48.80	2.2757	16 33 51.8	12.768
20	21 1 5.17	2.2701	16 21 3.0	12.857
21	21 3 21.21	2.2646	16 8 9.0	12.943
22	21 5 36.92	2.2591	15 55 9.8	13.028
23	21 7 52.30	2.2537	15 42 5.6	13.112
24	21 10 7.36	2.2483	−15 28 56.4	+13.194

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	MARCH 29.					MARCH 31.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	21 10 7.36	2.2483	−15 28 56.4	+13.194	0	22 52 52.30	2.0577	−3 50 24.9	+15.338
1	21 12 22.09	2.2428	15 15 42.3	13.274	1	22 54 55.69	2.0553	3 35 4.3	15.347
2	21 14 36.50	2.2376	15 2 23.5	13.353	2	22 56 58.94	2.0531	3 19 43.3	15.353
3	21 16 50.60	2.2323	14 49 0.0	13.431	3	22 59 2.06	2.0509	3 4 21.9	15.360
4	21 19 4.38	2.2271	14 35 31.8	13.507	4	23 1 5.05	2.0488	2 49 0.1	15.366
5	21 21 17.85	2.2219	14 21 59.2	13.581	5	23 3 7.92	2.0468	2 33 38.0	15.369
6	21 23 31.01	2.2168	14 8 22.1	13.653	6	23 5 10.67	2.0448	2 18 15.8	15.371
7	21 25 43.87	2.2118	13 54 40.8	13.724	7	23 7 13.30	2.0429	2 2 53.5	15.373
8	21 27 56.42	2.2068	13 40 55.2	13.794	8	23 9 15.82	2.0411	1 47 31.1	15.373
9	21 30 8.68	2.2018	13 27 5.5	13.862	9	23 11 18.23	2.0393	1 32 8.8	15.371
10	21 32 20.64	2.1968	13 13 11.8	13.928	10	23 13 20.54	2.0377	1 16 46.6	15.368
11	21 34 32.30	2.1919	12 59 14.1	13.993	11	23 15 22.75	2.0360	1 1 24.7	15.363
12	21 36 43.67	2.1872	12 45 12.6	14.056	12	23 17 24.86	2.0344	0 46 3.1	15.357
13	21 38 54.76	2.1825	12 31 7.4	14.118	13	23 19 26.88	2.0330	0 30 41.9	15.350
14	21 41 5.57	2.1778	12 16 58.5	14.178	14	23 21 28.82	2.0317	0 15 21.1	15.343
15	21 43 16.10	2.1732	12 2 46.0	14.238	15	23 23 30.68	2.0303	−0 0 0.8	15.333
16	21 45 26.35	2.1686	11 48 30.0	14.294	16	23 25 32.46	2.0291	+0 15 18.8	15.321
17	21 47 36.33	2.1641	11 34 10.7	14.349	17	23 27 34.17	2.0279	0 30 37.7	15.309
18	21 49 46.04	2.1597	11 19 48.1	14.403	18	23 29 35.81	2.0268	0 45 55.9	15.296
19	21 51 55.49	2.1553	11 5 22.3	14.456	19	23 31 37.38	2.0257	1 1 13.2	15.281
20	21 54 4.67	2.1509	10 50 53.4	14.508	20	23 33 38.89	2.0248	1 16 29.6	15.265
21	21 56 13.60	2.1468	10 36 21.4	14.558	21	23 35 40.35	2.0238	1 31 45.0	15.248
22	21 58 22.28	2.1426	10 21 46.5	14.605	22	23 37 41.75	2.0229	1 46 59.3	15.229
23	22 0 30.71	2.1384	−10 7 8.8	+14.651	23	23 39 43.10	2.0222	+2 2 12.5	+15.210
	MARCH 30.					APRIL 1.			
0	22 2 38.89	2.1343	− 9 52 28.4	+14.696	0	23 41 44.41	2.0215	+2 17 24.5	+15.188
1	22 4 46.83	2.1303	9 37 45.3	14.739	1	23 43 45.68	2.0208	2 32 35.1	15.166
2	22 6 54.53	2.1264	9 22 59.7	14.781	2	23 45 46.91	2.0202	2 47 44.4	15.143
3	22 9 2.00	2.1226	9 8 11.6	14.822	3	23 47 48.10	2.0197	3 2 52.3	15.118
4	22 11 9.24	2.1188	8 53 21.1	14.861	4	23 49 49.27	2.0193	3 17 58.6	15.092
5	22 13 16.26	2.1151	8 38 28.3	14.898	5	23 51 50.41	2.0188	3 33 3.3	15.065
6	22 15 23.05	2.1114	8 23 33.3	14.934	6	23 53 51.53	2.0185	3 48 6.4	15.037
7	22 17 29.63	2.1078	8 8 36.2	14.969	7	23 55 52.63	2.0183	4 3 7.7	15.007
8	22 19 35.99	2.1043	7 53 37.0	15.003	8	23 57 53.72	2.0181	4 18 7.2	14.976
9	22 21 42.15	2.1009	7 38 35.9	15.034	9	23 59 54.80	2.0179	4 33 4.8	14.944
10	22 23 48.10	2.0975	7 23 32.9	15.064	10	0 1 55.87	2.0178	4 48 0.5	14.911
11	22 25 53.85	2.0943	7 8 28.2	15.093	11	0 3 56.94	2.0178	5 2 54.1	14.876
12	22 27 59.41	2.0910	6 53 21.8	15.120	12	0 5 58.01	2.0179	5 17 45.6	14.840
13	22 30 4.77	2.0878	6 38 13.8	15.146	13	0 7 59.09	2.0180	5 32 34.9	14.803
14	22 32 9.95	2.0848	6 23 4.3	15.170	14	0 10 0.17	2.0182	5 47 22.0	14.766
15	22 34 14.94	2.0817	6 7 53.4	15.193	15	0 12 1.27	2.0184	6 2 6.8	14.727
16	22 36 19.75	2.0788	5 52 41.1	15.215	16	0 14 2.38	2.0187	6 16 49.2	14.687
17	22 38 24.39	2.0759	5 37 27.6	15.234	17	0 16 3.51	2.0191	6 31 29.2	14.645
18	22 40 28.86	2.0731	5 22 13.0	15.253	18	0 18 4.67	2.0195	6 46 6.6	14.602
19	22 42 33.16	2.0703	5 6 57.2	15.272	19	0 20 5.85	2.0199	7 0 41.4	14.558
20	22 44 37.29	2.0676	4 51 40.4	15.288	20	0 22 7.06	2.0204	7 15 13.6	14.513
21	22 46 41.27	2.0651	4 36 22.7	15.302	21	0 24 8.30	2.0210	7 29 43.0	14.467
22	22 48 45.10	2.0625	4 21 4.2	15.315	22	0 26 9.58	2.0217	7 44 9.6	14.419
23	22 50 48.77	2.0600	4 5 44.9	15.328	23	0 28 10.90	2.0223	7 58 33.3	14.371
24	22 52 52.30	2.0577	− 3 50 24.9	+15.338	24	0 30 12.26	2.0231	+8 12 54.1	+14.322

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	APRIL 2.					APRIL 4.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	0 30 12.26	2.0231	+ 8 12 54.1	+14.322	0	2 9 2.26	2.1083	+18 23 7.6	+10.724
1	0 32 13.67	2.0239	8 27 11.9	14.271	1	2 11 8.83	2.1107	18 33 48.1	10.626
2	0 34 15.13	2.0248	8 41 26.6	14.219	2	2 13 15.54	2.1131	18 44 22.7	10.528
3	0 36 16.64	2.0257	8 55 38.2	14.167	3	2 15 22.40	2.1155	18 54 51.4	10.428
4	0 38 18.21	2.0267	9 9 46.6	14.113	4	2 17 29.40	2.1179	19 5 14.1	10.328
5	0 40 19.84	2.0277	9 23 51.7	14.057	5	2 19 36.55	2.1204	19 15 30.8	10.228
6	0 42 21.53	2.0288	9 37 53.4	14.001	6	2 21 43.85	2.1228	19 25 41.4	10.125
7	0 44 23.29	2.0298	9 51 51.8	13.944	7	2 23 51.29	2.1253	19 35 45.8	10.022
8	0 46 25.11	2.0310	10 5 46.7	13.885	8	2 25 58.88	2.1278	19 45 44.0	9.918
9	0 48 27.01	2.0323	10 19 38.0	13.826	9	2 28 6.62	2.1302	19 55 36.0	9.815
10	0 50 28.98	2.0335	10 33 25.8	13.766	10	2 30 14.50	2.1326	20 5 21.8	9.710
11	0 52 31.03	2.0348	10 47 9.9	13.704	11	2 32 22.53	2.1351	20 15 1.2	9.603
12	0 54 33.15	2.0361	11 0 50.3	13.642	12	2 34 30.71	2.1375	20 24 34.2	9.497
13	0 56 35.36	2.0375	11 14 26.9	13.578	13	2 36 39.03	2.1399	20 34 0.8	9.390
14	0 58 37.65	2.0389	11 27 59.6	13.513	14	2 38 47.50	2.1424	20 43 21.0	9.283
15	1 0 40.03	2.0405	11 41 28.4	13.447	15	2 40 56.12	2.1448	20 52 34.7	9.173
16	1 2 42.51	2.0421	11 54 53.2	13.380	16	2 43 4.88	2.1472	21 1 41.8	9.064
17	1 4 45.08	2.0436	12 8 14.0	13.312	17	2 45 13.78	2.1496	21 10 42.4	8.954
18	1 6 47.74	2.0452	12 21 30.6	13.243	18	2 47 22.83	2.1520	21 19 36.3	8.843
19	1 8 50.50	2.0468	12 34 43.1	13.173	19	2 49 32.02	2.1543	21 28 23.6	8.733
20	1 10 53.36	2.0485	12 47 51.4	13.103	20	2 51 41.35	2.1567	21 37 4.2	8.620
21	1 12 56.32	2.0502	13 0 55.4	13.030	21	2 53 50.82	2.1590	21 45 38.0	8.508
22	1 14 59.38	2.0520	13 13 55.0	12.957	22	2 56 0.43	2.1614	21 54 5.1	8.394
23	1 17 2.56	2.0539	+13 26 50.2	+12.883	23	2 58 10.19	2.1638	+22 2 25.3	+ 8.279
	APRIL 3.					APRIL 5.			
0	1 19 5.85	2.0558	+13 39 41.0	+12.808	0	3 0 20.08	2.1660	+22 10 38.6	+ 8.165
1	1 21 9.25	2.0576	13 52 27.2	12.732	1	3 2 30.11	2.1683	22 18 45.1	8.050
2	1 23 12.76	2.0595	14 5 8.8	12.655	2	3 4 40.27	2.1705	22 26 44.6	7.934
3	1 25 16.39	2.0614	14 17 45.8	12.578	3	3 6 50.57	2.1728	22 34 37.2	7.818
4	1 27 20.13	2.0633	14 30 18.1	12.498	4	3 9 1.00	2.1749	22 42 22.8	7.701
5	1 29 23.99	2.0654	14 42 45.6	12.418	5	3 11 11.56	2.1771	22 50 1.3	7.583
6	1 31 27.98	2.0675	14 55 8.2	12.337	6	3 13 22.25	2.1793	22 57 32.8	7.465
7	1 33 32.09	2.0695	15 7 26.0	12.255	7	3 15 33.07	2.1813	23 4 57.1	7.346
8	1 35 36.32	2.0716	15 19 38.8	12.173	8	3 17 44.01	2.1834	23 12 14.3	7.227
9	1 37 40.68	2.0738	15 31 46.7	12.089	9	3 19 55.08	2.1855	23 19 24.3	7.108
10	1 39 45.17	2.0759	15 43 49.5	12.004	10	3 22 6.27	2.1875	23 26 27.2	6.988
11	1 41 49.79	2.0781	15 55 47.2	11.918	11	3 24 17.58	2.1895	23 33 22.8	6.866
12	1 43 54.54	2.0803	16 7 39.7	11.832	12	3 26 29.01	2.1915	23 40 11.1	6.745
13	1 45 59.42	2.0825	16 19 27.0	11.745	13	3 28 40.56	2.1934	23 46 52.2	6.623
14	1 48 4.44	2.0848	16 31 9.1	11.657	14	3 30 52.22	2.1953	23 53 25.9	6.501
15	1 50 9.59	2.0870	16 42 45.8	11.567	15	3 33 3.99	2.1972	23 59 52.3	6.378
16	1 52 14.88	2.0893	16 54 17.1	11.477	16	3 35 15.88	2.1990	24 6 11.3	6.255
17	1 54 20.31	2.0917	17 5 43.0	11.386	17	3 37 27.87	2.2007	24 12 22.9	6.131
18	1 56 25.88	2.0940	17 17 3.4	11.294	18	3 39 39.96	2.2024	24 18 27.0	6.007
19	1 58 31.59	2.0963	17 28 18.3	11.201	19	3 41 52.16	2.2042	24 24 23.7	5.883
20	2 0 37.44	2.0987	17 39 27.5	11.107	20	3 44 4.46	2.2058	24 30 13.0	5.758
21	2 2 43.43	2.1010	17 50 31.1	11.013	21	3 46 16.86	2.2074	24 35 54.7	5.633
22	2 4 49.56	2.1034	18 1 29.0	10.918	22	3 48 29.35	2.2089	24 41 28.9	5.507
23	2 6 55.84	2.1058	18 12 21.2	10.822	23	3 50 41.93	2.2105	24 46 55.5	5.381
24	2 9 2.26	2.1083	+18 23 7.6	+10.724	24	3 52 54.61	2.2120	+24 52 14.6	+ 5.255

79790°—1916——4

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	APRIL 6.					APRIL 8.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	3 52 54.61	2.2120	+24 52 14.6	+5.255	0	5 39 43.24	2.2154	+26 35 12.7	−0.979
1	3 55 7.37	2.2134	24 57 26.1	5.128	1	5 41 56.12	2.2140	26 34 10.1	1.108
2	3 57 20.22	2.2148	25 2 30.0	5.002	2	5 44 8.92	2.2126	26 32 59.8	1.235
3	3 59 33.14	2.2160	25 7 26.3	4.874	3	5 46 21.63	2.2111	26 31 41.9	1.363
4	4 1 46.14	2.2173	25 12 14.9	4.746	4	5 48 34.25	2.2095	26 30 16.3	1.491
5	4 3 59.22	2.2186	25 16 55.8	4.618	5	5 50 46.77	2.2078	26 28 43.0	1.618
6	4 6 12.37	2.2198	25 21 29.0	4.490	6	5 52 59.19	2.2062	26 27 2.1	1.745
7	4 8 25.59	2.2208	25 25 54.6	4.362	7	5 55 11.51	2.2045	26 25 13.6	1.872
8	4 10 38.87	2.2219	25 30 12.4	4.233	8	5 57 23.73	2.2028	26 23 17.5	1.998
9	4 12 52.22	2.2229	25 34 22.5	4.103	9	5 59 35.84	2.2008	26 21 13.9	2.123
10	4 15 5.62	2.2238	25 38 24.8	3.974	10	6 1 47.83	2.1989	26 19 2.7	2.249
11	4 17 19.08	2.2248	25 42 19.4	3.845	11	6 3 59.71	2.1970	26 16 44.0	2.374
12	4 19 32.59	2.2256	25 46 6.2	3.715	12	6 6 11.47	2.1950	26 14 17.8	2.499
13	4 21 46.15	2.2264	25 49 45.2	3.586	13	6 8 23.11	2.1930	26 11 44.1	2.623
14	4 23 59.76	2.2272	25 53 16.5	3.457	14	6 10 34.63	2.1909	26 9 3.0	2.748
15	4 26 13.41	2.2278	25 56 40.0	3.326	15	6 12 46.02	2.1888	26 6 14.4	2.872
16	4 28 27.09	2.2283	25 59 55.6	3.195	16	6 14 57.29	2.1867	26 3 18.4	2.995
17	4 30 40.81	2.2289	26 3 3.4	3.065	17	6 17 8.42	2.1844	26 0 15.0	3.118
18	4 32 54.56	2.2294	26 6 3.4	2.934	18	6 19 19.42	2.1822	25 57 4.2	3.241
19	4 35 8.34	2.2298	26 8 55.5	2.803	19	6 21 30.28	2.1798	25 53 46.1	3.363
20	4 37 22.14	2.2302	26 11 39.8	2.673	20	6 23 41.00	2.1775	25 50 20.7	3.484
21	4 39 35.96	2.2305	26 14 16.2	2.542	21	6 25 51.58	2.1751	25 46 48.0	3.605
22	4 41 49.80	2.2308	26 16 44.8	2.411	22	6 28 2.01	2.1727	25 43 8.1	3.726
23	4 44 3.65	2.2309	+26 19 5.5	+2.279	23	6 30 12.30	2.1703	+25 39 20.9	−3.847
	APRIL 7.					APRIL 9.			
0	4 46 17.51	2.2311	+26 21 18.3	+2.148	0	6 32 22.44	2.1678	+25 35 26.5	−3.967
1	4 48 31.38	2.2312	26 23 23.3	2.018	1	6 34 32.43	2.1653	25 31 24.9	4.086
2	4 50 45.25	2.2312	26 25 20.4	1.887	2	6 36 42.27	2.1627	25 27 16.2	4 204
3	4 52 59.12	2.2311	26 27 9.7	1.756	3	6 38 51.95	2.1600	25 23 0.4	4.323
4	4 55 12.98	2.2309	26 28 51.1	1.624	4	6 41 1.47	2.1574	25 18 37.4	4.442
5	4 57 26.83	2.2308	26 30 24.6	1.493	5	6 43 10.84	2.1548	25 14 7.4	4.558
6	4 59 40.67	2.2305	26 31 50.2	1.362	6	6 45 20.04	2.1520	25 9 30.4	4.676
7	5 1 54.49	2.2302	26 33 8.0	1 231	7	6 47 29.08	2.1493	25 4 46.3	4.793
8	5 4 8.29	2.2298	26 34 17.9	1.100	8	6 49 37.96	2.1466	24 59 55.3	4.908
9	5 6 22.07	2.2294	26 35 20.0	0.969	9	6 51 46.67	2.1438	24 54 57.3	5.024
10	5 8 35.82	2.2288	26 36 14.2	0.838	10	6 53 55.22	2.1411	24 49 52.4	5.139
11	5 10 49.53	2.2283	26 37 0.6	0.708	11	6 56 3.60	2.1382	24 44 40.6	5.254
12	5 13 3.21	2.2277	26 37 39.1	0.577	12	6 58 11.80	2.1353	24 39 21.9	5.368
13	5 15 16.85	2.2270	26 38 9.8	0.447	13	7 0 19.84	2.1325	24 33 56.4	5.482
14	5 17 30.45	2.2263	26 38 32.7	0.316	14	7 2 27.70	2.1295	24 28 24.1	5.594
15	5 19 44.00	2.2254	26 38 47.7	0.185	15	7 4 35.38	2.1266	24 22 45.1	5.706
16	5 21 57.50	2.2245	26 38 54.9	+0.055	16	7 6 42.89	2.1238	24 16 59.4	5.818
17	5 24 10.94	2.2236	26 38 54.3	−0.075	17	7 8 50.23	2.1208	24 11 6.9	5.930
18	5 26 24.33	2.2226	26 38 45.9	0.204	18	7 10 57.39	2.1178	24 5 7.8	6.040
19	5 28 37.65	2.2215	26 38 29.8	0.333	19	7 13 4.37	2.1149	23 59 2.1	6.150
20	5 30 50.91	2.2205	26 38 5.9	0.463	20	7 15 11.18	2.1119	23 52 49.8	6.260
21	5 33 4.11	2.2193	26 37 34.2	0.593	21	7 17 17.80	2.1088	23 46 30.9	6.369
22	5 35 17.23	2.2180	26 36 54.8	0.722	22	7 19 24.24	2.1058	23 40 5.5	6.478
23	5 37 30.27	2.2168	26 36 7.6	0.851	23	7 21 30.50	2.1028	23 33 33.6	6.586
24	*5 39 43.24*	*2.2154*	*+26 35 12.7*	*−0.979*	24	7 23 36.58	2.0998	+23 26 55.2	−6.693

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	APRIL 10.					APRIL 12.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	7 23 36.58	2.0998	+23 26 55.2	− 6.693	0	9 1 1.77	1.9668	+16 13 40.2	−11.117
1	7 25 42.48	2.0968	23 20 10.4	6.799	1	9 2 59.71	1.9647	16 2 30.9	11.193
2	7 27 48.19	2.0937	23 13 19.3	6.905	2	9 4 57.53	1.9627	15 51 17.1	11.268
3	7 29 53.72	2.0907	23 6 21.8	7.011	3	9 6 55.23	1.9606	15 39 58.7	11.343
4	7 31 59.07	2.0877	22 59 18.0	7.116	4	9 8 52.80	1.9586	15 28 35.9	11.418
5	7 34 4.24	2.0846	22 52 7.9	7.221	5	9 10 50.26	1.9568	15 17 8.6	11.492
6	7 36 9.22	2.0815	22 44 51.5	7.324	6	9 12 47.61	1.9548	15 5 36.9	11.565
7	7 38 14.02	2.0785	22 37 29.0	7.427	7	9 14 44.84	1.9529	14 54 0.8	11.637
8	7 40 18.64	2.0754	22 30 0.3	7.530	8	9 16 41.96	1.9512	14 42 20.5	11.708
9	7 42 23.07	2.0723	22 22 25.4	7.632	9	9 18 38.98	1.9494	14 30 35.8	11.779
10	7 44 27.32	2.0693	22 14 44.5	7.733	10	9 20 35.89	1.9477	14 18 47.0	11.849
11	7 46 31.39	2.0663	22 6 57.5	7.833	11	9 22 32.70	1.9461	14 6 53.9	11.919
12	7 48 35.28	2.0633	21 59 4.5	7.933	12	9 24 29.42	1.9445	13 54 56.7	11.985
13	7 50 38.99	2.0603	21 51 5.5	8.033	13	9 26 26.04	1.9429	13 42 55.4	12.056
14	7 52 42.51	2.0572	21 43 0.5	8.133	14	9 28 22.57	1.9414	13 30 50.0	12.123
15	7 54 45.85	2.0542	21 34 49.6	8.231	15	9 30 19.01	1.9399	13 18 40.6	12.190
16	7 56 49.01	2.0512	21 26 32.8	8.328	16	9 32 15.36	1.9385	13 6 27.2	12.257
17	7 58 51.99	2.0483	21 18 10.2	8.425	17	9 34 11.63	1.9373	12 54 9.8	12.323
18	8 0 54.80	2.0453	21 9 41.8	8.522	18	9 36 7.83	1.9360	12 41 48.5	12.387
19	8 2 57.42	2.0423	21 1 7.6	8.618	19	9 38 3.95	1.9347	12 29 23.4	12.450
20	8 4 59.87	2.0393	20 52 27.7	8.713	20	9 39 59.99	1.9334	12 16 54.5	12.513
21	8 7 2.14	2.0364	20 43 42.1	8.807	21	9 41 55.96	1.9323	12 4 21.8	12.577
22	8 9 4.24	2.0335	20 34 50.9	8.901	22	9 43 51.87	1.9313	11 51 45.3	12.638
23	8 11 6.16	2.0306	+20 25 54.0	− 8.994	23	9 45 47.71	1.9303	+11 39 5.2	−12.699
	APRIL 11.					APRIL 13.			
0	8 13 7.91	2.0278	+20 16 51.6	− 9.087	0	9 47 43.50	1.9293	+11 26 21.4	−12.760
1	8 15 9.49	2.0248	20 7 43.6	9.179	1	9 49 39.23	1.9283	11 13 34.0	12.819
2	8 17 10.89	2.0219	19 58 30.1	9.270	2	9 51 34.90	1.9274	11 0 43.1	12.878
3	8 19 12.12	2.0192	19 49 11.2	9.361	3	9 53 30.52	1.9267	10 47 48.6	12.937
4	8 21 13.19	2.0164	19 39 46.8	9.451	4	9 55 26.10	1.9260	10 34 50.7	12.993
5	8 23 14.09	2.0137	19 30 17.1	9.540	5	9 57 21.64	1.9253	10 21 49.4	13.050
6	8 25 14.83	2.0109	19 20 42.0	9.629	6	9 59 17.14	1.9247	10 8 44.7	13.107
7	8 27 15.40	2.0081	19 11 1.6	9.718	7	10 1 12.60	1.9241	9 55 36.6	13.163
8	8 29 15.80	2.0054	19 1 15.9	9.805	8	10 3 8.03	1.9236	9 42 25.2	13.217
9	8 31 16.05	2.0028	18 51 25.0	9.892	9	10 5 3.43	1.9231	9 29 10.6	13.270
10	8 33 16.14	2.0002	18 41 28.9	9.978	10	10 6 58.80	1.9228	9 15 52.8	13.323
11	8 35 16.07	1.9976	18 31 27.6	10.063	11	10 8 54.16	1.9225	9 2 31.9	13.375
12	8 37 15.85	1.9950	18 21 21.3	10.148	12	10 10 49.50	1.9223	8 49 7.8	13.427
13	8 39 15.47	1.9924	18 11 9.9	10.233	13	10 12 44.83	1.9220	8 35 40.7	13.477
14	8 41 14.94	1.9899	18 0 53.4	10.317	14	10 14 40.14	1.9218	8 22 10.6	13.527
15	8 43 14.26	1.9874	17 50 31.9	10.399	15	10 16 35.45	1.9218	8 8 37.5	13.576
16	8 45 13.43	1.9850	17 40 5.5	10.482	16	10 18 30.76	1.9218	7 55 1.5	13.624
17	8 47 12.46	1.9826	17 29 34.1	10.563	17	10 20 26.06	1.9218	7 41 22.6	13.672
18	8 49 11.34	1.9803	17 18 57.9	10.644	18	10 22 21.37	1.9219	7 27 40.9	13.718
19	8 51 10.09	1.9779	17 8 16.8	10.725	19	10 24 16.69	1.9222	7 13 56.5	13.763
20	8 53 8.69	1.9756	16 57 30.9	10.804	20	10 26 12.03	1.9224	7 0 9.3	13.809
21	8 55 7.16	1.9734	16 46 40.3	10.883	21	10 28 7.38	1.9227	6 46 19.4	13.853
22	8 57 5.50	1.9712	16 35 45.0	10.962	22	10 30 2.75	1.9231	6 32 26.9	13.897
23	8 59 3.70	1.9689	16 24 44.9	11.040	23	10 31 58.15	1.9235	6 18 31.8	13.939
24	9 1 1.77	1.9668	+16 13 40.2	−11.117	24	10 33 53.57	1.9240	+ 6 4 34.2	−13.980

MOON, 1916.

GREENWICH MEAN TIME.

APRIL 14.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	h m s	s	° ′ ″	″
0	10 33 53.57	1.9240	+6 4 34.2	−13.980
1	10 35 49.03	1.9246	5 50 34.2	14.021
2	10 37 44.52	1.9253	5 36 31.7	14.062
3	10 39 40.06	1.9260	5 22 26.8	14.101
4	10 41 35.64	1.9268	5 8 19.6	14.138
5	10 43 31.27	1.9276	4 54 10.2	14.176
6	10 45 26.95	1.9285	4 39 58.5	14.213
7	10 47 22.69	1.9295	4 25 44.7	14.248
8	10 49 18.49	1.9305	4 11 28.7	14.283
9	10 51 14.35	1.9317	3 57 10.7	14.317
10	10 53 10.29	1.9329	3 42 50.7	14.349
11	10 55 6.30	1.9342	3 28 28.8	14.381
12	10 57 2.39	1.9355	3 14 5.0	14.413
13	10 58 58.56	1.9369	2 59 39.3	14.443
14	11 0 54.82	1.9384	2 45 11.9	14.471
15	11 2 51.17	1.9399	2 30 42.8	14.499
16	11 4 47.61	1.9415	2 16 12.0	14.527
17	11 6 44.15	1.9433	2 1 39.6	14.553
18	11 8 40.80	1.9451	1 47 5.7	14.578
19	11 10 37.56	1.9469	1 32 30.3	14.603
20	11 12 34.43	1.9488	1 17 53.4	14.626
21	11 14 31.42	1.9508	1 3 15.2	14.648
22	11 16 28.53	1.9528	0 48 35.7	14.668
23	11 18 25.76	1.9549	+0 33 55.0	−14.688

APRIL 15.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	h m s	s	° ′ ″	″
0	11 20 23.12	1.9572	+0 19 13.1	−14.708
1	11 22 20.62	1.9594	+0 4 30.1	14.726
2	11 24 18.25	1.9618	−0 10 14.0	14.743
3	11 26 16.03	1.9643	0 24 59.0	14.758
4	11 28 13.96	1.9668	0 39 45.0	14.774
5	11 30 12.04	1.9693	0 54 31.9	14 788
6	11 32 10.28	1.9720	1 9 19.5	14.799
7	11 34 8.68	1.9747	1 24 7.8	14.811
8	11 36 7.24	1.9775	1 38 56.8	14.822
9	11 38 5.98	1.9804	1 53 46.4	14.831
10	11 40 4.89	1.9833	2 8 36.5	14.839
11	11 42 3.98	1.9863	2 23 27.1	14.846
12	11 44 3.25	1.9804	2 38 18.0	14.851
13	11 46 2.71	1.9926	2 53 9.2	14.856
14	11 48 2.36	1.9958	3 8 0.7	14.859
15	11 50 2.21	1.9993	3 22 52.3	14.862
16	11 52 2.27	2.0027	3 37 44.1	14.863
17	11 54 2.53	2.0061	3 52 35.9	14.863
18	11 56 3.00	2.0096	4 7 27.6	14.860
19	11 58 3.68	2.0132	4 22 19.1	14.858
20	12 0 4.58	2.0169	4 37 10.5	14.854
21	12 2 5.71	2.0208	4 52 1.6	14.848
22	12 4 7.07	2.0246	5 6 52.3	14.842
23	12 6 8.66	2.0285	5 21 42.6	14.834
24	12 8 10.49	2.0325	−5 36 32.4	−14.825

APRIL 16.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	h m s	s	° ′ ″	″
0	12 8 10.49	2.0325	− 5 36 32.4	−14.8
1	12 10 12.56	2.0366	5 51 21.6	14.81
2	12 12 14.88	2.0408	6 6 10.1	14.8
3	12 14 17.45	2.0449	6 20 57.9	14.7
4	12 16 20.27	2.0492	6 35 44.8	14.77
5	12 18 23.35	2.0536	6 50 30.8	14.75
6	12 20 26.70	2.0580	7 5 15.8	14.74
7	12 22 30.31	2.0625	7 19 59.7	14.7
8	12 24 34.20	2.0672	7 34 42.5	14.70
9	12 26 38.37	2.0718	7 49 24.0	14.68
10	12 28 42.82	2.0766	8 4 4.2	14.65
11	12 30 47.56	2.0813	8 18 43.0	14.63
12	12 32 52.58	2.0862	8 33 20.2	14.60
13	12 34 57.90	2.0912	8 47 55.8	14.5
14	12 37 3.52	2.0962	9 2 29.8	14.55
15	12 39 9.44	2.1013	9 17 1.9	14.52
16	12 41 15.67	2.1064	9 31 32.2	14.4
17	12 43 22.21	2.1116	9 46 0.6	14.4
18	12 45 29.06	2.1169	10 0 26.9	14.4
19	12 47 36.24	2.1223	10 14 51.0	14.3
20	12 49 43.74	2.1277	10 29 12.9	14.34
21	12 51 51.56	2.1332	10 43 32.4	14.3
22	12 53 59.72	2.1388	10 57 49.5	14.266
23	12 56 8.21	2.1443	−11 12 4.1	−14.222

APRIL 17.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	h m s	s	° ′ ″	″
0	12 58 17.04	2.1500	−11 26 16.1	−14.178
1	13 0 26.21	2.1558	11 40 25.4	14.131
2	13 2 35.73	2.1616	11 54 31.8	14.083
3	13 4 45.60	2.1674	12 8 35.3	14.033
4	13 6 55.82	2.1733	12 22 35.8	13.983
5	13 9 6.40	2.1793	12 36 33.2	13.930
6	13 11 17.34	2.1854	12 50 27.4	13.876
7	13 13 28.65	2.1915	13 4 18.3	13.820
8	13 15 40.32	2.1976	13 18 5.8	13.763
9	13 17 52.36	2.2038	13 31 49.8	13.703
10	13 20 4.78	2.2102	13 45 30.1	13.641
11	13 22 17.58	2.2164	13 59 6.7	13.578
12	13 24 30.75	2.2228	14 12 39.5	13.514
13	13 26 44.31	2.2292	14 26 8.4	13.448
14	13 28 58.25	2.2356	14 39 33.2	13.379
15	13 31 12.58	2.2421	14 52 53.9	13.309
16	13 33 27.30	2.2487	15 6 10.3	13.238
17	13 35 42.42	2.2553	15 19 22.4	13.164
18	13 37 57.93	2.2619	15 32 30.0	13.088
19	13 40 13.85	2.2687	15 45 33.0	13.012
20	13 42 30.17	2.2753	15 58 31.4	12.933
21	13 44 46.89	2.2820	16 11 25.0	12.853
22	13 47 4.01	2.2888	16 24 13.7	12.770
23	13 49 21.54	2.2956	16 36 57.4	12.685
24	13 51 39.48	2.3024	−16 49 35.9	−12.598

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	APRIL 18.					APRIL 20.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	13 51 39.48	2.3024	−16 49 35.9	−12.598	0	15 50 0.70	2.6142	−24 40 30.2	−6.356
1	13 53 57.83	2.3093	17 2 9.2	12.511	1	15 52 37.70	2.6191	24 46 46.5	6.186
2	13 56 16.59	2.3162	17 14 37.2	12.422	2	15 55 14.99	2.6238	24 52 52.5	6.015
3	13 58 35.77	2.3232	17 26 59.8	12.330	3	15 57 52.55	2.6283	24 58 48.3	5.843
4	14 0 55.37	2.3301	17 39 16.8	12.237	4	16 0 30.39	2.6329	25 4 33.7	5.670
5	14 3 15.38	2.3370	17 51 28.2	12.142	5	16 3 8.50	2.6373	25 10 8.7	5.496
6	14 5 35.81	2.3439	18 3 33.8	12.043	6	16 5 46.87	2.6416	25 15 33.2	5.321
7	14 7 56.65	2.3508	18 15 33.4	11.944	7	16 8 25.49	2.6457	25 20 47.2	5.144
8	14 10 17.91	2.3579	18 27 27.1	11.844	8	16 11 4.35	2.6496	25 25 50.5	4.967
9	14 12 39.60	2.3650	18 39 14.7	11.741	9	16 13 43.44	2.6534	25 30 43.2	4.788
10	14 15 1.71	2.3720	18 50 56.0	11.636	10	16 16 22.76	2.6572	25 35 25.1	4.608
11	14 17 24.24	2.3789	19 2 31.0	11.530	11	16 19 2.30	2.6607	25 39 56.2	4.428
12	14 19 47.18	2.3859	19 13 59.6	11.422	12	16 21 42.04	2.6641	25 44 16.5	4.247
13	14 22 10.55	2.3930	19 25 21.6	11.312	13	16 24 21.99	2.6673	25 48 25.8	4.064
14	14 24 34.34	2.4000	19 36 37.0	11.200	14	16 27 2.12	2.6703	25 52 24.2	3.882
15	14 26 58.55	2.4071	19 47 45.6	11.086	15	16 29 42.43	2.6733	25 56 11.6	3.698
16	14 29 23.19	2.4141	19 58 47.3	10.970	16	16 32 22.92	2.6762	25 59 47.9	3.513
17	14 31 48.24	2.4210	20 9 42.0	10.853	17	16 35 3.57	2.6787	26 3 13.1	3.328
18	14 34 13.71	2.4280	20 20 29.6	10.733	18	16 37 44.36	2.6811	26 6 27.2	3.142
19	14 36 39.60	2.4349	20 31 10.0	10.612	19	16 40 25.30	2.6834	26 9 30.1	2.955
20	14 39 5.90	2.4418	20 41 43.0	10.488	20	16 43 6.37	2.6856	26 12 21.8	2.768
21	14 41 32.62	2.4488	20 52 8.6	10.364	21	16 45 47.57	2.6876	26 15 2.2	2.580
22	14 43 59.75	2.4556	21 2 26.7	10.238	22	16 48 28.88	2.6893	26 17 31.4	2.393
23	14 46 27.29	2.4625	−21 12 37.1	−10.109	23	16 51 10.29	2.6910	−26 19 49.3	−2.203
	APRIL 19.					APRIL 21.			
0	14 48 55.25	2.4693	−21 22 39.8	− 9.979	0	16 53 51.80	2.6924	−26 21 55.8	−2.014
1	14 51 23.61	2.4761	21 32 34.6	9.847	1	16 56 33.38	2.6937	26 23 51.0	1.825
2	14 53 52.38	2.4828	21 42 21.4	9.713	2	16 59 15.04	2.6948	26 25 34.8	1.634
3	14 56 21.55	2.4895	21 52 0.1	9.578	3	17 1 56.75	2.6957	26 27 7.1	1.444
4	14 58 51.12	2.4962	22 1 30.7	9.440	4	17 4 38.52	2.6965	26 28 28.1	1.255
5	15 1 21.09	2.5028	22 10 52.9	9.301	5	17 7 20.33	2.6971	26 29 37.7	1.064
6	15 3 51.46	2.5094	22 20 6.8	9.161	6	17 10 2.17	2.6975	26 30 35.8	0.873
7	15 6 22.22	2.5158	22 29 12.2	9.018	7	17 12 44.03	2.6977	26 31 22.5	0.683
8	15 8 53.36	2.5223	22 38 9.0	8.874	8	17 15 25.89	2.6978	26 31 57.8	0.493
9	15 11 24.89	2.5286	22 46 57.1	8.728	9	17 18 7.76	2.6978	26 32 21.6	0.302
10	15 13 56.79	2.5349	22 55 36.4	8.581	10	17 20 49.62	2.6975	26 32 34.0	−0.111
11	15 16 29.08	2.5412	23 4 6.8	8.432	11	17 23 31.46	2.6970	26 32 34.9	+0.080
12	15 19 1.73	2.5473	23 12 28.2	8.281	12	17 26 13.26	2.6963	26 32 24.4	0.270
13	15 21 34.75	2.5533	23 20 40.5	8.128	13	17 28 55.01	2.6954	26 32 2.5	0.461
14	15 24 8.13	2.5593	23 28 43.6	7.975	14	17 31 36.71	2.6945	26 31 29.1	0.652
15	15 26 41.87	2.5653	23 36 37.5	7.820	15	17 34 18.35	2.6933	26 30 44.3	0.841
16	15 29 15.97	2.5712	23 44 22.0	7.663	16	17 36 59.91	2.6920	26 29 48.2	1.030
17	15 31 50.41	2.5768	23 51 57.0	7.504	17	17 39 41.39	2.6905	26 28 40.7	1.220
18	15 34 25.19	2.5824	23 59 22.5	7.345	18	17 42 22.77	2.6888	26 27 21.8	1.409
19	15 37 0.30	2.5880	24 6 38.4	7.183	19	17 45 4.05	2.6871	26 25 51.6	1.597
20	15 39 35.75	2.5935	24 13 44.5	7.020	20	17 47 45.22	2.6851	26 24 10.2	1.784
21	15 42 11.52	2.5988	24 20 40.8	6.857	21	17 50 26.26	2.6829	26 22 17.5	1.973
22	15 44 47.61	2.6040	24 27 27.3	6.692	22	17 53 7.17	2.6806	26 20 13.5	2.160
23	15 47 24.00	2.6091	24 34 3.8	6.524	23	17 55 47.93	2.6781	26 17 58.3	2.346
24	15 50 0.70	2.6142	−24 40 30.2	− 6.356	24	17 58 28.54	2.6754	−26 15 32.0	+2.532

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	APRIL 22.					APRIL 24.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	17 58 28.54	2.6754	−26 15 32.0	+ 2.532	0	20 1 29.80	2.4179	−20 59 44.6	+10.113
1	18 1 8.98	2.6726	26 12 54.5	2.717	1	20 3 54.67	2.4112	20 49 34.2	10.234
2	18 3 49.25	2.6697	26 10 6.0	2.901	2	20 6 19.14	2.4044	20 39 16.5	10.354
3	18 6 29.34	2.6666	26 7 6.4	3.085	3	20 8 43.20	2.3976	20 28 51.7	10.473
4	18 9 9.24	2.6633	26 3 55.8	3.268	4	20 11 6.85	2.3908	20 18 19.8	10.589
5	18 11 48.94	2.6599	26 0 34.3	3.449	5	20 13 30.10	2.3841	20 7 41.0	10.704
6	18 14 28.43	2.6564	25 57 1.9	3.630	6	20 15 52.94	2.3773	19 56 55.3	10.815
7	18 17 7.71	2.6528	25 53 18.7	3.810	7	20 18 15.38	2.3707	19 46 2.8	10.928
8	18 19 46.76	2.6488	25 49 24.7	3.990	8	20 20 37.42	2.3639	19 35 3.7	11.040
9	18 22 25.57	2.6449	25 45 19.9	4.169	9	20 22 59.05	2.3572	19 23 58.0	11.149
10	18 25 4.15	2.6408	25 41 4.4	4.346	10	20 25 20.28	2.3505	19 12 45.8	11.258
11	18 27 42.47	2.6366	25 36 38.4	4.522	11	20 27 41.11	2.3438	19 1 27.3	11.362
12	18 30 20.54	2.6323	25 32 1.8	4.698	12	20 30 1.54	2.3372	18 50 2.5	11.464
13	18 32 58.34	2.6278	25 27 14.7	4.872	13	20 32 21.57	2.3306	18 38 31.6	11.566
14	18 35 35.87	2.6231	25 22 17.2	5.045	14	20 34 41.21	2.3240	18 26 54.6	11.667
15	18 38 13.11	2.6183	25 17 9.3	5.217	15	20 37 0.45	2.3174	18 15 11.6	11.766
16	18 40 50.07	2.6136	25 11 51.2	5.388	16	20 39 19.30	2.3108	18 3 22.7	11.863
17	18 43 26.74	2.6086	25 6 22.8	5.558	17	20 41 37.75	2.3043	17 51 28.1	11.958
18	18 46 3.10	2.6035	25 0 44.3	5.726	18	20 43 55.82	2.2979	17 39 27.8	12.053
19	18 48 39.16	2.5984	24 54 55.7	5.893	19	20 46 13.50	2.2914	17 27 21.9	12.145
20	18 51 14.91	2.5932	24 48 57.1	6.059	20	20 48 30.79	2.2850	17 15 10.6	12.235
21	18 53 50.34	2.5878	24 42 48.6	6.223	21	20 50 47.70	2.2788	17 2 53.9	12.323
22	18 56 25.44	2.5823	24 36 30.3	6.387	22	20 53 4.24	2.2724	16 50 31.9	12.411
23	18 59 0.21	2.5768	−24 30 2.2	+ 6.549	23	20 55 20.39	2.2661	−16 38 4.6	+12.497
	APRIL 23.					APRIL 25.			
0	19 1 34.65	2.5711	−24 23 24.4	+ 6.710	0	20 57 36.17	2.2599	−16 25 32.3	+12.580
1	19 4 8.74	2.5653	24 16 37.0	6.869	1	20 59 51.58	2.2538	16 12 55.0	12.663
2	19 6 42.49	2.5595	24 9 40.1	7.027	2	21 2 6.62	2.2477	16 0 12.8	12.743
3	19 9 15.88	2.5536	24 2 33.8	7.183	3	21 4 21.30	2.2416	15 47 25.8	12.823
4	19 11 48.92	2.5477	23 55 18.2	7.338	4	21 6 35.61	2.2355	15 34 34.1	12.900
5	19 14 21.60	2.5417	23 47 53.3	7.492	5	21 8 49.56	2.2295	15 21 37.8	12.976
6	19 16 53.92	2.5356	23 40 19.2	7.643	6	21 11 3.15	2.2236	15 8 37.0	13.050
7	19 19 25.87	2.5294	23 32 36.1	7.793	7	21 13 16.39	2.2178	14 55 31.8	13.122
8	19 21 57.45	2.5232	23 24 44.0	7.943	8	21 15 29.29	2.2121	14 42 22.2	13.194
9	19 24 28.65	2.5168	23 16 43.0	8.090	9	21 17 41.84	2.2063	14 29 8.3	13.264
10	19 26 59.47	2.5105	23 8 33.2	8.236	10	21 19 54.04	2.2005	14 15 50.3	13.333
11	19 29 29.91	2.5042	23 0 14.7	8.380	11	21 22 5.90	2.1949	14 2 28.3	13.400
12	19 31 59.97	2.4977	22 51 47.6	8.523	12	21 24 17.43	2.1894	13 49 2.3	13.466
13	19 34 29.63	2.4912	22 43 12.0	8.664	13	21 26 28.63	2.1839	13 35 32.4	13.529
14	19 36 58.91	2.4848	22 34 27.9	8.804	14	21 28 39.50	2.1785	13 21 58.8	13.592
15	19 39 27.80	2.4782	22 25 35.5	8.943	15	21 30 50.05	2.1732	13 8 21.4	13.653
16	19 41 56.29	2.4715	22 16 34.8	9.079	16	21 33 0.28	2.1678	12 54 40.4	13.713
17	19 44 24.38	2.4648	22 7 26.0	9.213	17	21 35 10.19	2.1626	12 40 55.9	13.770
18	19 46 52.07	2.4583	21 58 9.2	9.347	18	21 37 19.79	2.1574	12 27 8.0	13.826
19	19 49 19.37	2.4516	21 48 44.4	9.478	19	21 39 29.08	2.1523	12 13 16.8	13.881
20	19 51 46.26	2.4448	21 39 11.8	9.608	20	21 41 38.07	2.1473	11 59 22.3	13.935
21	19 54 12.75	2.4382	21 29 31.4	9.738	21	21 43 46.75	2.1423	11 45 24.6	13.988
22	19 56 38.84	2.4314	21 19 43.3	9.864	22	21 45 55.14	2.1374	11 31 23.8	14.039
23	19 59 4.52	2.4247	21 9 47.7	9.989	23	21 48 3.24	2.1327	11 17 20.1	14.087
24	20 1 29.80	2.4179	−20 59 44.6	+10.113	24	21 50 11.06	2.1279	−11 3 13.4	+14.135

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	APRIL 26.			
	h m s	s	° ′ ″	″
0	21 50 11.06	2.1279	−11 3 13.4	+14.135
1	21 52 18.59	2.1233	10 49 3.9	14.181
2	21 54 25.85	2.1187	10 34 51.7	14.226
3	21 56 32.83	2.1141	10 20 36.8	14.269
4	21 58 39.54	2.1097	10 6 19.4	14.312
5	22 0 45.99	2.1053	9 51 59.4	14.353
6	22 2 52.18	2.1010	9 37 37.1	14.392
7	22 4 58.11	2.0968	9 23 12.4	14.430
8	22 7 3.79	2.0927	9 8 45.5	14.467
9	22 9 9.23	2.0886	8 54 16.4	14.502
10	22 11 14.42	2.0846	8 39 45.3	14.535
11	22 13 19.38	2.0807	8 25 12.2	14.568
12	22 15 24.10	2.0768	8 10 37.1	14.600
13	22 17 28.60	2.0731	7 56 0.2	14.629
14	22 19 32.87	2.0693	7 41 21.6	14.658
15	22 21 36.92	2.0658	7 26 41.3	14.686
16	22 23 40.76	2.0623	7 11 59.3	14.712
17	22 25 44.39	2.0588	6 57 15.9	14.736
18	22 27 47.81	2.0553	6 42 31.0	14.760
19	22 29 51.03	2.0521	6 27 44.7	14.782
20	22 31 54.06	2.0489	6 12 57.2	14.803
21	22 33 56.90	2.0458	5 58 8.4	14.823
22	22 35 59.55	2.0427	5 43 18.5	14.841
23	22 38 2.02	2.0397	− 5 28 27.5	+14.858
	APRIL 27.			
0	22 40 4.31	2.0368	− 5 13 35.5	+14.873
1	22 42 6.43	2.0340	4 58 42.7	14.888
2	22 44 8.39	2.0313	4 43 49.0	14.902
3	22 46 10.18	2.0285	4 28 54.5	14.913
4	22 48 11.81	2.0259	4 13 59.4	14.924
5	22 50 13.29	2.0235	3 59 3.6	14.934
6	22 52 14.63	2.0211	3 44 7.3	14.943
7	22 54 15.82	2.0187	3 29 10.5	14.950
8	22 56 16.87	2.0163	3 14 13.3	14.956
9	22 58 17.78	2.0142	2 59 15.8	14.961
10	23 0 18.57	2.0121	2 44 18.0	14.964
11	23 2 19.23	2.0100	2 29 20.1	14.967
12	23 4 19.77	2.0081	2 14 22.0	14.968
13	23 6 20.20	2.0062	1 59 23.9	14.968
14	23 8 20.51	2.0043	1 44 25.9	14.967
15	23 10 20.72	2.0026	1 29 27.9	14.965
16	23 12 20.82	2.0009	1 14 30.1	14.962
17	23 14 20.83	1.9993	0 59 32.5	14.958
18	23 16 20.74	1.9978	0 44 35.2	14.952
19	23 18 20.57	1.9964	0 29 38.3	14.944
20	23 20 20.31	1.9950	− 0 14 41.9	14.936
21	23 22 19.97	1.9938	+ 0 0 14.0	14.928
22	23 24 19.56	1.9926	0 15 9.4	14.918
23	23 26 19.08	1.9914	0 30 4.1	14.906
24	23 28 18.53	1.9903	+ 0 44 58.1	+14.893

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	APRIL 28.			
	h m s	s	° ′ ″	″
0	23 28 18.53	1.9903	+ 0 44 58.1	+14.893
1	23 30 17.92	1.9893	0 59 51.3	14.880
2	23 32 17.25	1.9884	1 14 43.7	14.865
3	23 34 16.53	1.9877	1 29 35.1	14.848
4	23 36 15,77	1.9869	1 44 25.5	14.832
5	23 38 14.96	1.9861	1 59 14.9	14.813
6	23 40 14.10	1.9854	2 14 3.1	14.794
7	23 42 13.21	1.9849	2 28 50.2	14.774
8	23 44 12.29	1.9845	2 43 36.0	14.753
9	23 46 11.35	1.9841	2 58 20.5	14.730
10	23 48 10.38	1.9837	3 13 3.6	14.707
11	23 50 9.39	1.9834	3 27 45.3	14.682
12	23 52 8.39	1.9833	3 42 25.4	14.656
13	23 54 7.38	1.9831	3 57 4.0	14.629
14	23 56 6.36	1.9830	4 11 40.9	14.601
15	23 58 5.34	1.9831	4 26 16.1	14.572
16	0 0 4.33	1.9832	4 40 49.5	14.542
17	0 2 3.32	1.9833	4 55 21.1	14.510
18	0 4 2.32	1.9834	5 9 50.7	14.478
19	0 6 1.33	1.9837	5 24 18.4	14.445
20	0 8 0.36	1.9841	5 38 44.1	14.411
21	0 9 59.42	1.9845	5 53 7.7	14.375
22	0 11 58.50	1.9849	6 7 29.1	14.338
23	0 13 57.61	1.9854	+ 6 21 48.3	+14.301
	APRIL 29.			
0	0 15 56.75	1.9860	+ 6 36 5.2	+14.263
1	0 17 55.93	1.9867	6 50 19.8	14.223
2	0 19 55.15	1.9874	7 4 31.9	14.182
3	0 21 54.42	1.9882	7 18 41.6	14.140
4	0 23 53.73	1.9889	7 32 48,7	14.097
5	0 25 53.09	1.9898	7 46 53.2	14.053
6	0 27 52.51	1.9908	8 0 55.1	14.009
7	0 29 51.99	1.9918	8 14 54.3	13.963
8	0 31 51.53	1.9929	8 28 50.6	13.915
9	0 33 51.14	1.9941	8 42 44.1	13.868
10	0 35 50.82	1.9953	8 56 34.7	13.818
11	0 37 50.57	1.9964	9 10 22.3	13.768
12	0 39 50.39	1.9977	9 24 6.9	13.718
13	0 41 50.29	1.9991	9 37 48.4	13.665
14	0 43 50.28	2.0005	9 51 26.7	13.612
15	0 45 50.35	2.0019	10 5 1.8	13.558
16	0 47 50.51	2.0034	10 18 33.7	13.503
17	0 49 50.76	2.0050	10 32 2.2	13.447
18	0 51 51.11	2.0067	10 45 27.3	13.389
19	0 53 51.56	2.0083	10 58 48.9	13.331
20	0 55 52.10	2.0099	11 12 7.0	13.272
21	0 57 52.75	2.0118	11 25 21.5	13.212
22	0 59 53.51	2.0135	11 38 32.4	13.151
23	1 1 54.37	2.0153	11 51 39.6	13.088
24	1 3 55.35	2.0173	+12 4 43.0	+13.025

MOON, 1916.

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	APRIL 30.					MAY 2.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	1 3 55.35	2.0173	+12 4 43.0	+13.025	0	2 43 32.61	2.1407	+20 58 53.8	+8.885
1	1 5 56.44	2.0192	12 17 42.6	12.961	1	2 45 41.13	2.1434	21 7 43.7	8.778
2	1 7 57.65	2.0212	12 30 38.3	12.896	2	2 47 49.82	2.1462	21 16 27.2	8.671
3	1 9 58.98	2.0232	12 43 30.0	12.829	3	2 49 58.67	2.1489	21 25 4.2	8.562
4	1 12 0.43	2.0253	12 56 17.8	12.763	4	2 52 7.69	2.1516	21 33 34.6	8.452
5	1 14 2.01	2.0273	13 9 1.5	12.694	5	2 54 16.86	2.1542	21 41 58.4	8.342
6	1 16 3.71	2.0296	13 21 41.1	12.625	6	2 56 26.19	2.1569	21 50 15.6	8.231
7	1 18 5.55	2.0317	13 34 16.5	12.554	7	2 58 35.69	2.1597	21 58 26.1	8.119
8	1 20 7.51	2.0338	13 46 47.6	12.483	8	3 0 45.35	2.1623	22 6 29.9	8.006
9	1 22 9.61	2.0362	13 59 14.5	12.412	9	3 2 55.16	2.1648	22 14 27.0	7.894
10	1 24 11.85	2.0385	14 11 37.0	12.338	10	3 5 5.12	2.1673	22 22 17.2	7.780
11	1 26 14.23	2.0408	14 23 55.1	12.264	11	3 7 15.24	2.1699	22 30 0.6	7.666
12	1 28 16.74	2.0431	14 36 8.7	12.189	12	3 9 25.51	2.1724	22 37 37.1	7.551
13	1 30 19.40	2.0455	14 48 17.8	12.113	13	3 11 35.93	2.1749	22 45 6.7	7.436
14	1 32 22.20	2.0479	15 0 22.3	12.037	14	3 13 46.50	2.1774	22 52 29.4	7.319
15	1 34 25.15	2.0503	15 12 22.2	11.959	15	3 15 57.22	2.1798	22 59 45.0	7.202
16	1 36 28.24	2.0528	15 24 17.4	11.880	16	3 18 8.08	2.1822	23 6 53.6	7.085
17	1 38 31.49	2.0554	15 36 7.8	11.800	17	3 20 19.08	2.1845	23 13 55.2	6.968
18	1 40 34.89	2.0579	15 47 53.4	11.719	18	3 22 30.22	2.1868	23 20 49.7	6.848
19	1 42 38.44	2.0605	15 59 34.1	11.638	19	3 24 41.50	2.1892	23 27 37.0	6.729
20	1 44 42.15	2.0631	16 11 9.9	11.555	20	3 26 52.92	2.1914	23 34 17.2	6.610
21	1 46 46.01	2.0657	16 22 40.7	11.472	21	3 29 4.47	2.1936	23 40 50.2	6.489
22	1 48 50.03	2.0683	16 34 6.5	11.388	22	3 31 16.15	2.1958	23 47 15.9	6.368
23	1 50 54.21	2.0710	+16 45 27.2	+11.302	23	3 33 27.96	2.1979	+23 53 34.4	+6.247
	MAY 1.					MAY 3.			
0	1 52 58.55	2.0737	+16 56 42.7	+11.215	0	3 35 39.90	2.2000	+23 59 45.5	+6.124
1	1 55 3.05	2.0763	17 7 53.0	11.128	1	3 37 51.96	2.2019	24 5 49.3	6.003
2	1 57 7.71	2.0790	17 18 58.1	11.041	2	3 40 4.13	2.2038	24 11 45.8	5.880
3	1 59 12.53	2.0818	17 29 57.9	10.952	3	3 42 16.42	2.2058	24 17 34.9	5.757
4	2 1 17.52	2.0846	17 40 52.3	10.862	4	3 44 28.83	2.2078	24 23 16.6	5.633
5	2 3 22.68	2.0873	17 51 41.3	10.771	5	3 46 41.35	2.2096	24 28 50.8	5.508
6	2 5 28.00	2.0901	18 2 24.8	10.679	6	3 48 53.98	2.2113	24 34 17.6	5.384
7	2 7 33.49	2.0928	18 13 2.8	10.587	7	3 51 6.71	2.2131	24 39 36.9	5.258
8	2 9 39.14	2.0956	18 23 35.2	10.493	8	3 53 19.55	2.2148	24 44 48.6	5.133
9	2 11 44.96	2.0985	18 34 2.0	10.399	9	3 55 32.48	2.2163	24 49 52.8	5.007
10	2 13 50.96	2.1013	18 44 23.1	10.304	10	3 57 45.51	2.2179	24 54 49.4	4.881
11	2 15 57.12	2.1041	18 54 38.5	10.208	11	3 59 58.63	2.2194	24 59 38.5	4.754
12	2 18 3.45	2.1069	19 4 48.1	10.111	12	4 2 11.84	2.2208	25 4 19.9	4.627
13	2 20 9.95	2.1098	19 14 51.8	10.013	13	4 4 25.13	2.2223	25 8 53.7	4.499
14	2 22 16.62	2.1125	19 24 49.7	9.915	14	4 6 38.51	2.2236	25 13 19.8	4.372
15	2 24 23.45	2.1153	19 34 41.6	9.816	15	4 8 51.96	2.2248	25 17 38.3	4.244
16	2 26 30.46	2.1182	19 44 27.6	9.716	16	4 11 5.49	2.2260	25 21 49.1	4.116
17	2 28 37.64	2.1210	19 54 7.5	9.614	17	4 13 19.08	2.2271	25 25 52.2	3.987
18	2 30 44.98	2.1238	20 3 41.3	9.513	18	4 15 32.74	2.2283	25 29 47.5	3.858
19	2 32 52.50	2.1268	20 13 9.0	9.410	19	4 17 46.47	2.2293	25 33 35.1	3.729
20	2 35 0.19	2.1295	20 22 30.5	9.307	20	4 20 0.25	2.2302	25 37 15.0	3.600
21	2 37 8.04	2.1323	20 31 45.8	9.203	21	4 22 14.09	2.2311	25 40 47.1	3.471
22	2 39 16.06	2.1351	20 40 54.8	9.098	22	4 24 27.98	2.2318	25 44 11.5	3.341
23	2 41 24.25	2.1379	20 49 57.5	8.992	23	4 26 41.91	2.2326	25 47 28.0	3.210
24	2 43 32.61	2.1407	+20 58 53.8	+ 8.885	24	4 28 55.89	2.2333	+25 50 36.7	+3.080

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	MAY 4.					MAY 6.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	4 28 55.89	2.2333	+25 50 36.7	+3.080	0	6 15 35.90	2.1856	+25 48 35.4	−3.097
1	4 31 9.91	2.2339	25 53 37.6	2.950	1	6 17 46.96	2.1830	25 45 25.9	3.218
2	4 33 23.96	2.2345	25 56 30.7	2.819	2	6 19 57.86	2.1804	25 42 9.2	3.339
3	4 35 38.05	2.2350	25 59 15.9	2.688	3	6 22 8.61	2.1778	25 38 45.2	3.460
4	4 37 52.16	2.2353	26 1 53.3	2.558	4	6 24 19.20	2.1752	25 35 14.0	3.581
5	4 40 6.29	2.2357	26 4 22.9	2.428	5	6 26 29.63	2.1725	25 31 35.5	3.701
6	4 42 20.44	2.2360	26 6 44.6	2.296	6	6 28 39.90	2.1698	25 27 49.9	3.819
7	4 44 34.61	2.2363	26 8 58.4	2.165	7	6 30 50.00	2.1670	25 23 57.2	3.938
8	4 46 48.79	2.2363	26 11 4.4	2.034	8	6 32 59.94	2.1642	25 19 57.3	4.057
9	4 49 2.97	2.2363	26 13 2.5	1.903	9	6 35 9.70	2.1613	25 15 50.4	4.174
10	4 51 17.15	2.2363	26 14 52.7	1.772	10	6 37 19.29	2.1584	25 11 36.4	4.293
11	4 53 31.33	2.2363	26 16 35.1	1.641	11	6 39 28.71	2.1555	25 7 15.3	4.409
12	4 55 45.50	2.2361	26 18 9.6	1.509	12	6 41 37.95	2.1525	25 2 47.3	4.524
13	4 57 59.66	2.2358	26 19 36.2	1.378	13	6 43 47.01	2.1495	24 58 12.4	4.640
14	5 0 13.80	2.2356	26 20 55.0	1.248	14	6 45 55.89	2.1465	24 53 30.5	4.756
15	5 2 27.93	2.2353	26 22 5.9	1.116	15	6 48 4.59	2.1434	24 48 41.7	4.870
16	5 4 42.03	2.2348	26 23 8.9	0.985	16	6 50 13.10	2.1403	24 43 46.1	4.984
17	5 6 56.10	2.2343	26 24 4.1	0.854	17	6 52 21.42	2.1372	24 38 43.6	5.098
18	5 9 10.14	2.2337	26 24 51.4	0.723	18	6 54 29.56	2.1340	24 33 34.4	5.209
19	5 11 24.14	2.2330	26 25 30.8	0.592	19	6 56 37.50	2.1308	24 28 18.5	5.322
20	5 13 38.10	2.2323	26 26 2.4	0.462	20	6 58 45.25	2.1276	24 22 55.8	5.433
21	5 15 52.02	2.2315	26 26 26.2	0.332	21	7 0 52.81	2.1244	24 17 26.5	5.544
22	5 18 5.88	2.2306	26 26 42.2	0.201	22	7 3 0.18	2.1212	24 11 50.5	5.655
23	5 20 19.69	2.2298	+26 26 50.3	+0.071	23	7 5 7.35	2.1178	+24 6 7.9	−5.764
	MAY 5.					MAY 7.			
0	5 22 33.45	2.2288	+26 26 50.7	−0.058	0	7 7 14.32	2.1146	+24 0 18.8	−5.873
1	5 24 47.14	2.2277	26 26 43.3	0.189	1	7 9 21.10	2.1113	23 54 23.2	5.982
2	5 27 0.77	2.2266	26 26 28.0	0.319	2	7 11 27.68	2.1079	23 48 21.0	6.090
3	5 29 14.33	2.2253	26 26 5.0	0.448	3	7 13 34.05	2.1046	23 42 12.4	6.197
4	5 31 27.81	2.2240	26 25 34.2	0.578	4	7 15 40.23	2.1013	23 35 57.4	6.303
5	5 33 41.21	2.2227	26 24 55.7	0.707	5	7 17 46.21	2.0979	23 29 36.0	6.410
6	5 35 54.53	2.2213	26 24 9.4	0.835	6	7 19 51.98	2.0945	23 23 8.2	6.515
7	5 38 7.76	2.2198	26 23 15.5	0.963	7	7 21 57.55	2.0912	23 16 34.2	6.619
8	5 40 20.91	2.2183	26 22 13.8	1.093	8	7 24 2.92	2.0878	23 9 53.9	6.723
9	5 42 33.96	2.2167	26 21 4.4	1.220	9	7 26 8.09	2.0844	23 3 7.4	6.827
10	5 44 46.91	2.2150	26 19 47.4	1.348	10	7 28 13.05	2.0810	22 56 14.7	6.930
11	5 46 59.76	2.2133	26 18 22.7	1.475	11	7 30 17.81	2.0776	22 49 15.8	7.032
12	5 49 12.50	2.2115	26 16 50.4	1.602	12	7 32 22.36	2.0742	22 42 10.9	7.133
13	5 51 25.14	2.2097	26 15 10.5	1.728	13	7 34 26.71	2.0708	22 34 59.9	7.234
14	5 53 37.66	2.2077	26 13 23.0	1.855	14	7 36 30.85	2.0673	22 27 42.8	7.334
15	5 55 50.06	2.2058	26 11 27.9	1.982	15	7 38 34.79	2.0639	22 20 19.8	7.433
16	5 58 2.35	2.2038	26 9 25.2	2.107	16	7 40 38.52	2.0605	22 12 50.8	7.533
17	6 0 14.51	2.2017	26 7 15.1	2.231	17	7 42 42.05	2.0571	22 5 15.9	7.630
18	6 2 26.55	2.1995	26 4 57.5	2.357	18	7 44 45.37	2.0537	21 57 35.2	7.728
19	6 4 38.45	2.1973	26 2 32.3	2.482	19	7 46 48.49	2.0503	21 49 48.6	7.825
20	6 6 50.22	2.1950	25 59 59.7	2.605	20	7 48 51.41	2.0469	21 41 56.2	7.921
21	6 9 1.85	2.1927	25 57 19.7	2.728	21	7 50 54.12	2.0435	21 33 58.1	8.016
22	6 11 13.34	2.1903	25 54 32.3	2.852	22	7 52 56.63	2.0402	21 25 54.3	8.111
23	6 13 24.69	2.1880	25 51 37.5	2.974	23	7 54 58.94	2.0368	21 17 44.8	8.205
24	6 15 35.90	*2.1856*	*+25 48 35.4*	*−3.097*	24	7 57 1.05	2.0335	+21 9 29.7	−8.29[illegible]

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
		MAY 8.		
	h m s	s	° ′ ″	″
0	7 57 1.05	2.0335	+21 9 29.7	– 8.298
1	7 59 2.96	2.0302	21 1 9.0	8.391
2	8 1 4.67	2.0268	20 52 42.8	8.483
3	8 3 6.18	2.0235	20 44 11.0	8.575
4	8 5 7.49	2.0203	20 35 33.8	8.666
5	8 7 8.61	2.0170	20 26 51.1	8.757
6	8 9 9.53	2.0138	20 18 3.0	8.846
7	8 11 10.26	2.0105	20 9 9.6	8.934
8	8 13 10.79	2.0073	20 0 10.9	9.023
9	8 15 11.13	2.0041	19 51 6.9	9.110
10	8 17 11.28	2.0009	19 41 57.7	9.197
11	8 19 11.24	1.9978	19 32 43.3	9.283
12	8 21 11.02	1.9948	19 23 23.8	9.368
13	8 23 10.61	1.9917	19 13 59.1	9.453
14	8 25 10.02	1.9886	19 4 29.4	9.537
15	8 27 9.24	1.9855	18 54 54.7	9.620
16	8 29 8.28	1.9826	18 45 15.0	9.703
17	8 31 7.15	1.9797	18 35 30.3	9.786
18	8 33 5.84	1.9767	18 25 40.7	9.867
19	8 35 4.35	1.9738	18 15 46.3	9.947
20	8 37 2.69	1.9709	18 5 47.1	10.028
21	8 39 0.86	1.9681	17 55 43.0	10.108
22	8 40 58.86	1.9653	17 45 34.2	10.186
23	8 42 56.70	1.9626	+17 35 20.7	–10.264
		MAY 9.		
0	8 44 54.37	1.9598	+17 25 2.5	–10.342
1	8 46 51.88	1.9572	17 14 39.7	10.418
2	8 48 49.23	1.9545	17 4 12.3	10.495
3	8 50 46.42	1.9519	16 53 40.3	10.571
4	8 52 43.46	1.9493	16 43 3.8	10.645
5	8 54 40.34	1.9468	16 32 22.9	10.718
6	8 56 37.08	1.9444	16 21 37.6	10.793
7	8 58 33.67	1.9419	16 10 47.8	10.866
8	9 0 30.11	1.9395	15 59 53.7	10.938
9	9 2 26.41	1.9372	15 48 55.2	11.010
10	9 4 22.57	1.9349	15 37 52.5	11.081
11	9 6 18.60	1.9327	15 26 45.5	11.151
12	9 8 14.49	1.9304	15 15 34.4	11.220
13	9 10 10.25	1.9283	15 4 19.1	11.289
14	9 12 5.88	1.9262	14 52 59.7	11.358
15	9 14 1.39	1.9242	14 41 36.2	11.425
16	9 15 56.78	1.9222	14 30 8.7	11.492
17	9 17 52.05	1.9202	14 18 37.2	11.558
18	9 19 47.20	1.9183	14 7 1.7	11.624
19	9 21 42.24	1.9164	13 55 22.3	11.689
20	9 23 37.17	1.9146	13 43 39.0	11.754
21	9 25 31.99	1.9128	13 31 51.8	11.818
22	9 27 26.71	1.9112	13 20 0.9	11.880
23	9 29 21.33	1.9095	13 8 6.2	11.943
24	*9 31 15.85*	*1.9079*	*+12 56 7.8*	*–12.004*

Hour.	Right Ascension.	Var. per Min.	Declination.	V p M
		MAY 10.		
	h m s	s	° ′ ″	
0	9 31 15.85	1.9079	+12 56 7.8	–12
1	9 33 10.28	1.9064	12 44 5.7	12
2	9 35 4.62	1.9049	12 32 0.0	12
3	9 36 58.87	1.9035	12 19 50.6	12
4	9 38 53.04	1.9022	12 7 37.7	12
5	9 40 47.13	1.9009	11 55 21.2	12
6	9 42 41.15	1.8997	11 43 1.2	12
7	9 44 35.09	1.8985	11 30 37.8	12
8	9 46 28.97	1.8974	11 18 11.0	12
9	9 48 22.78	1.8963	11 5 40.8	12
10	9 50 16.53	1.8953	10 53 7.3	12
11	9 52 10.22	1.8943	10 40 30.5	12
12	9 54 3.85	1.8935	10 27 50.4	12
13	9 55 57.44	1.8928	10 15 7.1	12
14	9 57 50.98	1.8919	10 2 20.7	12
15	9 59 44.47	1.8913	9 49 31.1	12
16	10 1 37.93	1.8908	9 36 38.4	12
17	10 3 31.36	1.8902	9 23 42.7	12
18	10 5 24.75	1.8896	9 10 43.9	13
19	10 7 18.11	1.8892	8 57 42.2	13
20	10 9 11.45	1.8889	8 44 37.5	13
21	10 11 4.78	1.8887	8 31 30.0	13
22	10 12 58.09	1.8883	8 18 19.6	13
23	10 14 51.38	1.8882	+ 8 5 6.4	–13
		MAY 11.		
0	10 16 44.67	1.8882	+ 7 51 50.4	–13
1	10 18 37.96	1.8882	7 38 31.7	13
2	10 20 31.25	1.8882	7 25 10.4	13
3	10 22 24.54	1.8883	7 11 46.4	13
4	10 24 17.85	1.8886	6 58 19.8	13
5	10 26 11.17	1.8888	6 44 50.6	13
6	10 28 4.50	1.8891	6 31 18.9	13
7	10 29 57.86	1.8895	6 17 44.8	13
8	10 31 51.24	1.8900	6 4 8.3	13
9	10 33 44.66	1.8906	5 50 29.4	13
10	10 35 38.11	1.8912	5 36 48.1	13
11	10 37 31.60	1.8919	5 23 4.5	13
12	10 39 25.14	1.8927	5 9 18.7	13
13	10 41 18.72	1.8935	4 55 30.7	13
14	10 43 12.36	1.8944	4 41 40.6	13
15	10 45 6.05	1.8954	4 27 48.3	13
16	10 46 59.81	1.8965	4 13 54.0	13
17	10 48 53.63	1.8976	3 59 57.6	13
18	10 50 47.52	1.8988	3 45 59.3	13
19	10 52 41.49	1.9002	3 31 59.1	14
20	10 54 35.54	1.9015	3 17 57.0	14
21	10 56 29.67	1.9029	3 3 53.0	14
22	10 58 23.89	1.9045	2 49 47.3	14
23	11 0 18.21	1.9061	2 35 39.8	14
24	11 2 12.62	1.9078	+ 2 21 30.7	–14

GREENWICH MEAN TIME.

MAY 12.

Hour.	Right Ascension.			Var. per Min.	Declination.			Var. per Min.
	h	m	s	s	°	′	″	″
0	11	2	12.62	1.9078	+2	21	30.7	−14.166
1	11	4	7.14	1.9095	2	7	19.9	14.193
2	11	6	1.76	1.9113	1	53	7.6	14.218
3	11	7	56.50	1.9133	1	38	53.7	14.243
4	11	9	51.35	1.9153	1	24	38.4	14.268
5	11	11	46.33	1.9173	1	10	21.6	14.292
6	11	13	41.43	1.9195	0	56	3.4	14.314
7	11	15	36.67	1.9218	0	41	43.9	14.335
8	11	17	32.04	1.9240	0	27	23.2	14.355
9	11	19	27.55	1.9264	+0	13	1.3	14.375
10	11	21	23.21	1.9289	−0	1	21.8	14.394
11	11	23	19.02	1.9314	0	15	46.0	14.412
12	11	25	14.98	1.9340	0	30	11.2	14.428
13	11	27	11.10	1.9368	0	44	37.4	14.444
14	11	29	7.39	1.9396	0	59	4.5	14.459
15	11	31	3.85	1.9425	1	13	32.5	14.474
16	11	33	0.49	1.9454	1	28	1.4	14.488
17	11	34	57.30	1.9484	1	42	31.0	14.499
18	11	36	54.30	1.9516	1	57	1.3	14.510
19	11	38	51.49	1.9548	2	11	32.2	14.520
20	11	40	48.87	1.9580	2	26	3.7	14.530
21	11	42	46.45	1.9614	2	40	35.8	14.538
22	11	44	44.24	1.9648	2	55	8.3	14.544
23	11	46	42.23	1.9683	−3	9	41.1	−14.550

MAY 13.

Hour.	Right Ascension.			Var. per Min.	Declination.			Var. per Min.
	h	m	s	s	°	′	″	″
0	11	48	40.44	1.9720	−3	24	14.3	−14.556
1	11	50	38.87	1.9757	3	38	47.8	14.559
2	11	52	37.52	1.9795	3	53	21.4	14.562
3	11	54	36.41	1.9834	4	7	55.2	14.563
4	11	56	35.53	1.9873	4	22	29.0	14.563
5	11	58	34.89	1.9914	4	37	2.8	14.563
6	12	0	34.50	1.9955	4	51	36.6	14.562
7	12	2	34.35	1.9997	5	6	10.2	14.558
8	12	4	34.46	2.0040	5	20	43.6	14.554
9	12	6	34.83	2.0083	5	35	16.7	14.549
10	12	8	35.46	2.0128	5	49	49.5	14.543
11	12	10	36.36	2.0173	6	4	21.8	14.534
12	12	12	37.54	2.0220	6	18	53.6	14.525
13	12	14	39.00	2.0267	6	33	24.8	14.515
14	12	16	40.74	2.0314	6	47	55.4	14.504
15	12	18	42.77	2.0363	7	2	25.3	14.491
16	12	20	45.09	2.0412	7	16	54.3	14.476
17	12	22	47.71	2.0463	7	31	22.4	14.461
18	12	24	50.64	2.0514	7	45	49.6	14.444
19	12	26	53.88	2.0566	8	0	15.7	14.426
20	12	28	57.43	2.0618	8	14	40.7	14.407
21	12	31	1.30	2.0673	8	29	4.5	14.386
22	12	33	5.50	2.0728	8	43	27.0	14.363
23	12	35	10.03	2.0783	8	57	48.1	14.340
24	12	37	14.89	2.0838	*−9*	*12*	*7.8*	−14.315

MAY 14.

Hour.	Right Ascension.			Var. per Min.	Declination.			Var. per Min.
	h	m	s	s	°	′	″	″
0	12	37	14.89	2.0838	− 9	12	7.8	−14.315
1	12	39	20.09	2.0895	9	26	25.9	14.288
2	12	41	25.63	2.0953	9	40	42.4	14.261
3	12	43	31.52	2.1011	9	54	57.2	14.231
4	12	45	37.76	2.1070	10	9	10.1	14.199
5	12	47	44.36	2.1130	10	23	21.1	14.168
6	12	49	51.32	2.1191	10	37	30.2	14.134
7	12	51	58.65	2.1253	10	51	37.2	14.098
8	12	54	6.35	2.1314	11	5	42.0	14.061
9	12	56	14.42	2.1377	11	19	44.5	14.023
10	12	58	22.87	2.1441	11	33	44.7	13.983
11	13	0	31.71	2.1506	11	47	42.4	13.941
12	13	2	40.94	2.1571	12	1	37.6	13.898
13	13	4	50.56	2.1637	12	15	30.1	13.853
14	13	7	0.58	2.1703	12	29	19.9	13.806
15	13	9	11.00	2.1770	12	43	6.8	13.758
16	13	11	21.82	2.1838	12	56	50.8	13.708
17	13	13	33.06	2.1908	13	10	31.7	13.656
18	13	15	44.71	2.1977	13	24	9.5	13.603
19	13	17	56.78	2.2047	13	37	44.0	13.548
20	13	20	9.27	2.2117	13	51	15.2	13.491
21	13	22	22.18	2.2188	14	4	42.9	13.433
22	13	24	35.52	2.2260	14	18	7.1	13.373
23	13	26	49.30	2.2333	−14	31	27.6	−13.310

MAY 15.

Hour.	Right Ascension.			Var. per Min.	Declination.			Var. per Min.
	h	m	s	s	°	′	″	″
0	13	29	3.51	2.2405	−14	44	44.3	−13.246
1	13	31	18.16	2.2478	14	57	57.1	13.180
2	13	33	33.25	2.2553	15	11	5.9	13.113
3	13	35	48.79	2.2628	15	24	10.6	13.043
4	13	38	4.78	2.2703	15	37	11.1	12.973
5	13	40	21.22	2.2778	15	50	7.3	12.899
6	13	42	38.12	2.2855	16	2	59.0	12.824
7	13	44	55.48	2.2931	16	15	46.2	12.748
8	13	47	13.29	2.3008	16	28	28.7	12.668
9	13	49	31.57	2.3086	16	41	6.4	12.588
10	13	51	50.32	2.3163	16	53	39.2	12.505
11	13	54	9.53	2.3241	17	6	7.0	12.421
12	13	56	29.21	2.3320	17	18	29.7	12.334
13	13	58	49.37	2.3399	17	30	47.1	12.246
14	14	1	10.00	2.3478	17	42	59.2	12.156
15	14	3	31.10	2.3557	17	55	5.8	12.063
16	14	5	52.68	2.3637	18	7	6.8	11.968
17	14	8	14.74	2.3718	18	19	2.0	11.872
18	14	10	37.29	2.3798	18	30	51.4	11.773
19	14	13	0.31	2.3877	18	42	34.8	11.673
20	14	15	23.81	2.3958	18	54	12.2	11.572
21	14	17	47.80	2.4038	19	5	43.4	11.467
22	14	20	12.27	2.4118	19	17	8.2	11.360
23	14	22	37.22	2.4199	19	28	26.6	11.252
24	14	25	2.66	2.4280	−19	39	38.4	−11.1[illegible]

MOON, 1916.

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	MAY 16.					MAY 18.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	14 25 2.66	2.4280	−19 39 38.4	−11.142	0	16 30 2.03	2.7439	−25 50 16.7	−3.635
1	14 27 28.58	2.4361	19 50 43.6	11.029	1	16 32 46.77	2.7474	25 53 49.0	3.442
2	14 29 54.99	2.4442	20 1 41.9	10.914	2	16 35 31.72	2.7508	25 57 9.7	3.248
3	14 32 21.88	2.4522	20 12 33.3	10.798	3	16 38 16.86	2.7538	26 0 18.8	3.053
4	14 34 49.25	2.4602	20 23 17.6	10.679	4	16 41 2.18	2.7568	26 3 16.1	2.858
5	14 37 17.10	2.4683	20 33 54.8	10.559	5	16 43 47.67	2.7595	26 6 1.7	2.661
6	14 39 45.44	2.4763	20 44 24.7	10.437	6	16 46 33.32	2.7621	26 8 35.4	2.463
7	14 42 14.26	2.4843	20 54 47.2	10.312	7	16 49 19.12	2.7644	26 10 57.3	2.267
8	14 44 43.55	2.4922	21 5 2.1	10.185	8	16 52 5.05	2.7665	26 13 7.4	2.068
9	14 47 13.52	2.5001	21 15 9.4	10.057	9	16 54 51.10	2.7684	26 15 5.5	1.869
10	14 49 43.56	2.5079	21 25 8.9	9.925	10	16 57 37.26	2.7702	26 16 51.7	1.670
11	14 52 14.27	2.5158	21 35 0.4	9.793	11	17 0 23.52	2.7718	26 18 25.9	1.470
12	14 54 45.46	2.5238	21 44 44.0	9.658	12	17 3 9.87	2.7731	26 19 48.1	1.270
13	14 57 17.12	2.5315	21 54 19.4	9.521	13	17 5 56.29	2.7743	26 20 58.3	1.069
14	14 59 49.24	2.5392	22 3 46.5	9.383	14	17 8 42.78	2.7752	26 21 56.4	0.868
15	15 2 21.82	2.5469	22 13 5.3	9.243	15	17 11 29.31	2.7758	26 22 42.5	0.668
16	15 4 54.87	2.5546	22 22 15.6	9.100	16	17 14 15.88	2.7763	26 23 16.6	0.467
17	15 7 28.37	2.5621	22 31 17.3	8.955	17	17 17 2.47	2.7767	26 25 38.5	0.265
18	15 10 2.32	2.5695	22 40 10.2	8.808	18	17 19 49.08	2.7768	26 23 48.4	−0.064
19	15 12 36.71	2.5769	22 48 54.3	8.661	19	17 22 35.69	2.7767	26 23 46.2	+0.138
20	15 15 11.55	2.5843	22 57 29.5	8.511	20	17 25 22.28	2.7763	26 23 31.9	0.338
21	15 17 46.83	2.5916	23 5 55.6	8.358	21	17 28 8.85	2.7758	26 23 5.6	0.539
22	15 20 22.54	2.5988	23 14 12.5	8.205	22	17 30 55.38	2.7752	26 22 27.2	0.741
23	15 22 58.68	2.6059	−23 22 20.2	− 8.050	23	17 33 41.87	2.7743	−26 21 36.7	+0.943
	MAY 17.					MAY 19.			
0	15 25 35.25	2.6130	−23 30 18.5	− 7.892	0	17 36 28.29	2.7731	−26 20 34.1	+1.143
1	15 28 12.24	2.6199	23 38 7.2	7.732	1	17 39 14.64	2.7718	26 19 19.5	1.343
2	15 30 49.64	2.6267	23 45 46.3	7.570	2	17 42 0.90	2.7702	26 17 53.0	1.543
3	15 33 27.44	2.6333	23 53 15.6	7.407	3	17 44 47.06	2.7684	26 16 14.4	1.743
4	15 36 5.64	2.6400	24 0 35.1	7.243	4	17 47 33.11	2.7665	26 14 23.9	1.941
5	15 38 44.24	2.6466	24 7 44.7	7.077	5	17 50 19.04	2.7644	26 12 21.5	2.139
6	15 41 23.23	2.6529	24 14 44.3	6.908	6	17 53 4.84	2.7621	26 10 7.2	2.337
7	15 44 2.59	2.6592	24 21 33.7	6.738	7	17 55 50.49	2.7595	26 7 41.1	2.534
8	15 46 42.33	2.6654	24 28 12.9	6.568	8	17 58 35.98	2.7568	26 5 3.1	2.731
9	15 49 22.44	2.6714	24 34 41.8	6.394	9	18 1 21.31	2.7540	26 2 13.4	2.926
10	15 52 2.90	2.6773	24 41 0.2	6.219	10	18 4 6.46	2.7509	25 59 12.0	3.121
11	15 54 43.71	2.6830	24 47 8.1	6.044	11	18 6 51.42	2.7476	25 55 58.9	3.315
12	15 57 24.86	2.6887	24 53 5.5	5.868	12	18 9 36.17	2.7441	25 52 34.2	3.508
13	16 0 6.35	2.6942	24 58 52.2	5.688	13	18 12 20.71	2.7405	25 48 57.9	3.701
14	16 2 48.16	2.6995	25 4 28.0	5.507	14	18 15 5.03	2.7367	25 45 10.1	3.892
15	16 5 30.29	2.7047	25 9 53.0	5.326	15	18 17 49.11	2.7327	25 41 10.9	4.083
16	16 8 12.72	2.7096	25 15 7.1	5.143	16	18 20 32.95	2.7285	25 37 0.2	4.273
17	16 10 55.44	2.7145	25 20 10.1	4.958	17	18 23 16.53	2.7242	25 32 38.2	4.460
18	16 13 38.46	2.7193	25 25 2.0	4.773	18	18 25 59.85	2.7198	25 28 5.0	4.647
19	16 16 21.76	2.7238	25 29 42.8	4.586	19	18 28 42.90	2.7152	25 23 20.6	4.833
20	16 19 5.32	2.7282	25 34 12.3	4.398	20	18 31 25.67	2.7104	25 18 25.1	5.018
21	16 21 49.14	2.7323	25 38 30.5	4.209	21	18 34 8.15	2.7055	25 13 18.5	5.201
22	16 24 33.20	2.7363	25 42 37.4	4.019	22	18 36 50.33	2.7003	25 8 1.0	5.383
23	16 27 17.50	2.7403	25 46 32.8	3.828	23	18 39 32.19	2.6951	25 2 32.6	5.564
24	*16 30 2.03*	*2.7439*	*−25 50 16.7*	*− 3.635*	24	18 42 13.74	2.6898	−24 56 53.3	+5.744

GREENWICH MEAN TIME.

MAY 20.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	h m s	s	° ′ ″	″
0	18 42 13.74	2.6898	−24 56 53.3	+ 5.744
1	18 44 54.96	2.6843	24 51 3.3	5.922
2	18 47 35.85	2.6786	24 45 2.7	6.098
3	18 50 16.39	2.6728	24 38 51.6	6.273
4	18 52 56.58	2.6669	24 32 30.0	6.447
5	18 55 36.42	2.6609	24 25 58.0	6.619
6	18 58 15.89	2.6548	24 19 15.7	6.789
7	19 0 54.99	2.6486	24 12 23.3	6.958
8	19 3 33.72	2.6423	24 5 20.8	7.125
9	19 6 12.06	2.6358	23 58 8.3	7.292
10	19 8 50.01	2.6293	23 50 45.8	7.456
11	19 11 27.57	2.6226	23 43 13.6	7.618
12	19 14 4.72	2.6158	23 35 31.7	7.778
13	19 16 41.47	2.6090	23 27 40.2	7.937
14	19 19 17.80	2.6021	23 19 39.3	8.093
15	19 21 53.72	2.5951	23 11 29.0	8.249
16	19 24 29.21	2.5880	23 3 9.4	8.403
17	19 27 4.28	2.5809	22 54 40.7	8.554
18	19 29 38.92	2.5738	22 46 2.9	8.704
19	19 32 13.13	2.5666	22 37 16.2	8.853
20	19 34 46.91	2.5593	22 28 20.6	8.999
21	19 37 20.24	2.5518	22 19 16.3	9.143
22	19 39 53.13	2.5444	22 10 3.4	9.286
23	19 42 25.57	2.5370	−22 0 42.0	+ 9.427

MAY 21.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
0	19 44 57.57	2.5295	−21 51 12.2	+ 9.565
1	19 47 29.11	2.5219	21 41 34.2	9.702
2	19 50 0.20	2.5144	21 31 48.0	9.838
3	19 52 30.84	2.5068	21 21 53.7	9.971
4	19 55 1.02	2.4992	21 11 51.5	10.102
5	19 57 30.74	2.4916	21 1 41.5	10.231
6	20 0 0.01	2.4840	20 51 23.8	10.358
7	20 2 28.82	2.4763	20 40 58.5	10.483
8	20 4 57.16	2.4685	20 30 25.8	10.607
9	20 7 25.04	2.4608	20 19 45.7	10.728
10	20 9 52.46	2.4532	20 8 58.4	10.848
11	20 12 19.42	2.4455	19 58 3.9	10.967
12	20 14 45.92	2.4378	19 47 2.4	11.083
13	20 17 11.95	2.4301	19 35 54.0	11.196
14	20 19 37.53	2.4225	19 24 38.9	11.308
15	20 22 2.65	2 4148	19 13 17.1	11.418
16	20 24 27.31	2.4071	19 1 48.8	11.526
17	20 26 51.50	2.3994	18 50 14.0	11.633
18	20 29 15.24	2.3918	18 38 32.9	11.737
19	20 31 38.52	2.3843	18 26 45.6	11.839
20	20 34 1.35	2.3768	18 14 52.2	11.940
21	20 36 23.73	2.3692	18 2 52.8	12.038
22	20 38 45.65	2.3617	17 50 47.6	12.134
23	20 41 7.13	2.3543	17 38 36.7	12.229
24	20 43 28.16	*2.3468*	*−17 26 20.1*	*+12.323*

MAY 22.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	h m s	s	° ′ ″	″
0	20 43 28.16	2.3468	−17 26 20.1	+12.323
1	20 45 48.74	2.3393	17 13 58.0	12.413
2	20 48 8.88	2.3320	17 1 30.5	12.503
3	20 50 28.58	2.3248	16 48 57.7	12.590
4	20 52 47.85	2.3175	16 36 19.7	12.676
5	20 55 6.68	2.3103	16 23 36.6	12.759
6	20 57 25.08	2.3031	16 10 48.6	12.841
7	20 59 43.05	2.2959	15 57 55.7	12.922
8	21 2 0.59	2.2888	15 44 58.0	13.000
9	21 4 17.71	2.2819	15 31 55.7	13.077
10	21 6 34.42	2.2750	15 18 48.8	13.152
11	21 8 50.71	2.2680	15 5 37.5	13.224
12	21 11 6.58	2.2612	14 52 21.9	13.295
13	21 13 22.05	2.2544	14 39 2.1	13.365
14	21 15 37.11	2.2477	14 25 38.1	13.433
15	21 17 51.77	2.2411	14 12 10.1	13.499
16	21 20 6.04	2.2345	13 58 38.2	13.563
17	21 22 19.91	2.2279	13 45 2.5	13.626
18	21 24 33.39	2.2215	13 31 23.1	13.688
19	21 26 46.49	2.2152	13 17 40.0	13.748
20	21 28 59.21	2.2089	13 3 53.4	13.805
21	21 31 11.56	2.2027	12 50 3.4	13.861
22	21 33 23.53	2.1964	12 36 10.1	13.915
23	21 35 35.13	2.1903	−12 22 13.6	+13.968

MAY 23.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
0	21 37 46.37	2.1843	−12 8 13.9	+14.020
1	21 39 57.25	2.1784	11 54 11.2	14.069
2	21 42 7.78	2.1726	11 40 5.6	14.118
3	21 44 17.96	2.1668	11 25 57.1	14.164
4	21 46 27.79	2.1610	11 11 45.9	14.209
5	21 48 37.28	2.1554	10 57 32.0	14.253
6	21 50 46.44	2.1499	10 43 15.6	14.294
7	21 52 55.27	2.1444	10 28 56.7	14.335
8	21 55 3.77	2.1390	10 14 35.4	14.374
9	21 57 11.95	2.1338	10 0 11.8	14.411
10	21 59 19.82	2.1286	9 45 46.1	14.447
11	22 1 27.38	2.1234	9 31 18.2	14.483
12	22 3 34.63	2.1183	9 16 48.2	14.516
13	22 5 41.58	2.1133	9 2 16.3	14.547
14	22 7 48.23	2.1084	8 47 42.6	14.577
15	22 9 54.59	2.1037	8 33 7.1	14.606
16	22 12 0.67	2.0990	8 18 29.9	14.633
17	22 14 6.47	2.0943	8 3 51.1	14.660
18	22 16 11.99	2.0898	7 49 10.7	14.685
19	22 18 17.24	2.0853	7 34 28.9	14.708
20	22 20 22.22	2.0809	7 19 45.8	14.729
21	22 22 26.95	2.0767	7 5 1.4	14.750
22	22 24 31.42	2.0724	6 50 15.8	14.770
23	22 26 35.64	2.0683	6 35 29.0	14.788
24	22 28 39.61	2.0643	− 6 20 41.2	+14.805

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	MAY 24.					MAY 26.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	22 28 39.61	2.0643	−6 20 41.2	+14.805	0	0 4 42.24	1.9690	+ 5 26 52.5	+14.262
1	22 30 43.35	2.0603	6 5 52.4	14.820	1	0 6 40.38	1.9690	5 41 7.1	14.224
2	22 32 46.35	2.0564	5 51 2.8	14.834	2	0 8 38.52	1.9690	5 55 19.4	14.187
3	22 34 50.12	2.0526	5 36 12.3	14.848	3	0 10 36.66	1.9691	6 9 29.5	14.148
4	22 36 53.16	2.0489	5 21 21.1	14.859	4	0 12 34.81	1.9693	6 23 37.2	14.106
5	22 38 55.99	2.0454	5 6 29.2	14.870	5	0 14 32.97	1.9695	6 37 42.5	14.068
6	22 40 58.61	2.0418	4 51 36.7	14.879	6	0 16 31.15	1.9698	6 51 45.4	14.026
7	22 43 1.01	2.0383	4 36 43.7	14.888	7	0 18 29.34	1.9701	7 5 45.8	13.985
8	22 45 3.21	2.0350	4 21 50.2	14.894	8	0 20 27.56	1.9706	7 19 43.6	13.942
9	22 47 5.21	2.0318	4 6 56.4	14.899	9	0 22 25.81	1.9711	7 33 38.8	13.898
10	22 49 7.02	2.0286	3 52 2.3	14.903	10	0 24 24.09	1.9717	7 47 31.3	13.853
11	22 51 8.64	2.0255	3 37 8.0	14.907	11	0 26 22.41	1.9723	8 1 21.1	13.807
12	22 53 10.08	2.0225	3 22 13.5	14.909	12	0 28 20.76	1.9729	8 15 8.1	13.759
13	22 55 11.34	2.0196	3 7 18.9	14.910	13	0 30 19.16	1.9737	8 28 52.2	13.712
14	22 57 12.43	2.0168	2 52 24.3	14.909	14	0 32 17.60	1.9745	8 42 33.5	13.663
15	22 59 13.35	2.0140	2 37 29.8	14.908	15	0 34 16.10	1.9754	8 56 11.8	13.614
16	23 1 14.11	2.0113	2 22 35.4	14.906	16	0 36 14.65	1.9763	9 9 47.2	13.564
17	23 3 14.71	2.0088	2 7 41.2	14.902	17	0 38 13.26	1.9773	9 23 19.5	13.512
18	23 5 15.16	2.0063	1 52 47.2	14.897	18	0 40 11.93	1.9784	9 36 48.6	13.459
19	23 7 15.46	2.0038	1 37 53.6	14.891	19	0 42 10.67	1.9796	9 50 14.6	13.406
20	23 9 15.62	2.0015	1 23 0.3	14.884	20	0 44 9.48	1.9808	10 3 37.3	13.352
21	23 11 15.64	1.9993	1 8 7.5	14.875	21	0 46 8.36	1.9820	10 16 56.8	13.298
22	23 13 15.53	1.9972	0 53 15.3	14.866	22	0 48 7.32	1.9833	10 30 13.0	13.241
23	23 15 15.30	1.9951	−0 38 23.6	+14.856	23	0 50 6.36	1.9847	+10 43 25.7	+13.183
	MAY 25.					MAY 27.			
0	23 17 14.94	1.9930	−0 23 32.6	+14.844	0	0 52 5.48	1.9861	+10 56 35.0	+13.126
1	23 19 14.46	1.9911	−0 8 42.3	14.832	1	0 54 4.69	1.9876	11 9 40.8	13.068
2	23 21 13.87	1.9893	+0 6 7.2	14.818	2	0 56 3.99	1.9891	11 22 43.1	13.008
3	23 23 13.18	1.9876	0 20 55.8	14.803	3	0 58 3.38	1.9907	11 35 41.8	12.948
4	23 25 12.38	1.9859	0 35 43.5	14.788	4	1 0 2.87	1.9923	11 48 36.9	12.887
5	23 27 11.49	1.9843	0 50 30.3	14.772	5	1 2 2.46	1.9940	12 1 28.2	12.824
6	23 29 10.50	1.9828	1 5 16.1	14.753	6	1 4 2.15	1.9958	12 14 15.8	12.762
7	23 31 9.42	1.9813	1 20 0.7	14.733	7	1 6 1.95	1.9976	12 26 59.6	12.698
8	23 33 8.26	1.9800	1 34 44.1	14.714	8	1 8 1.86	1.9994	12 39 39.5	12.633
9	23 35 7.02	1.9788	1 49 26.4	14.694	9	1 10 1.88	2.0013	12 52 15.5	12.567
10	23 37 5.71	1.9776	2 4 7.4	14.672	10	1 12 2.01	2.0032	13 4 47.5	12.500
11	23 39 4.33	1.9765	2 18 47.0	14.648	11	1 14 2.26	2.0052	13 17 15.5	12.433
12	23 41 2.89	1.9755	2 33 25.2	14.625	12	1 16 2.63	2.0073	13 29 39.4	12.364
13	23 43 1.39	1.9745	2 48 2.0	14.600	13	1 18 3.13	2.0093	13 41 59.2	12.295
14	23 44 59.83	1.9736	3 2 37.2	14.573	14	1 20 3.75	2.0114	13 54 14.8	12.225
15	23 46 58.22	1.9728	3 17 10.8	14.547	15	1 22 4.50	2.0136	14 6 26.2	12.154
16	23 48 56.57	1.9721	3 31 42.8	14.519	16	1 24 5.38	2.0158	14 18 33.3	12.082
17	23 50 54.87	1.9714	3 46 13.1	14.490	17	1 26 6.40	2.0181	14 30 36.0	12.009
18	23 52 53.14	1.9709	4 0 41.6	14.460	18	1 28 7.55	2.0203	14 42 34.4	11.936
19	23 54 51.38	1.9704	4 15 8.3	14.429	19	1 30 8.84	2.0227	14 54 28.3	11.861
20	23 56 49.59	1.9699	4 29 33.1	14.398	20	1 32 10.27	2.0250	15 6 17.7	11.786
21	23 58 47.77	1.9696	4 43 56.0	14.365	21	1 34 11.84	2.0274	15 18 2.6	11.710
22	0 0 45.94	1.9694	4 58 16.9	14.331	22	1 36 13.56	2.0299	15 29 42.9	11.633
23	0 2 44.10	1.9692	5 12 35.7	14.297	23	1 38 15.43	2.0323	15 41 18.5	11.554
24	0 4 42.24	1.9690	+5 26 52.5	+14.262	24	1 40 17.44	2.0348	+15 52 49.4	+11.475

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	MAY 28.					MAY 30.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	1 40 17.44	2.0348	+15 52 49.4	+11.475	0	3 21 10.53	2.1690	+23 17 16.9	+6.749
1	1 42 19.60	2.0373	16 4 15.5	11.396	1	3 23 20.75	2.1715	23 23 58.4	6.633
2	1 44 21.92	2.0400	16 15 36.9	11.316	2	3 25 31.11	2.1739	23 30 32.9	6.517
3	1 46 24.40	2.0426	16 26 53.4	11.234	3	3 27 41.62	2.1763	23 37 0.4	6.399
4	1 48 27.03	2.0451	16 38 5.0	11.153	4	3 29 52.27	2.1788	23 43 20.8	6.282
5	1 50 29.81	2.0478	16 49 11.7	11.069	5	3 32 3.07	2.1812	23 49 34.2	6.163
6	1 52 32.76	2.0505	17 0 13.3	10.985	6	3 34 14.01	2.1835	23 55 40.4	6.044
7	1 54 35.87	2.0532	17 11 9.9	10.901	7	3 36 25.09	2.1858	24 1 39.5	5.925
8	1 56 39.14	2.0559	17 22 1.4	10.815	8	3 38 36.30	2.1880	24 7 31.4	5.805
9	1 58 42.58	2.0587	17 32 47.7	10.728	9	3 40 47.65	2.1903	24 13 16.1	5.685
10	2 0 46.18	2.0614	17 43 28.8	10.641	10	3 42 59.13	2.1923	24 18 53.6	5.564
11	2 2 49.95	2.0643	17 54 4.6	10.553	11	3 45 10.73	2.1944	24 24 23.8	5.443
12	2 4 53.89	2.0671	18 4 35.1	10.464	12	3 47 22.46	2.1965	24 29 46.7	5.321
13	2 6 58.00	2.0698	18 15 0.3	10.374	13	3 49 34.31	2.1985	24 35 2.3	5.198
14	2 9 2.27	2.0726	18 25 20.0	10.283	14	3 51 46.28	2.2004	24 40 10.5	5.076
15	2 11 6.71	2.0755	18 35 34.3	10.193	15	3 53 58.36	2.2023	24 45 11.4	4.953
16	2 13 11.33	2.0784	18 45 43.1	10.100	16	3 56 10.56	2.2042	24 50 4.8	4.828
17	2 15 16.12	2.0813	18 55 46.3	10.007	17	3 58 22.86	2.2059	24 54 50.8	4.704
18	2 17 21.08	2.0842	19 5 43.9	9.913	18	4 0 35.27	2.2077	24 59 29.3	4.579
19	2 19 26.22	2.0871	19 15 35.9	9.818	19	4 2 47.78	2.2093	25 4 0.3	4.455
20	2 21 31.53	2.0900	19 25 22.1	9.723	20	4 5 0.39	2.2110	25 8 23.9	4.330
21	2 23 37.02	2.0929	19 35 2.6	9.627	21	4 7 13.10	2.2125	25 12 39.9	4.204
22	2 25 42.68	2.0958	19 44 37.3	9.530	22	4 9 25.89	2.2139	25 16 48.4	4.078
23	2 27 48.52	2.0988	+19 54 6.2	+ 9.432	23	4 11 38.77	2.2154	+25 20 49.3	+3.953
	MAY 29.					MAY 31.			
0	2 29 54.53	2.1017	+20 3 29.1	+ 9.333	0	4 13 51.74	2.2168	+25 24 42.7	+3.826
1	2 32 0.72	2.1046	20 12 46.1	9.234	1	4 16 4.79	2.2181	25 28 28.4	3.698
2	2 34 7.08	2.1075	20 21 57.2	9.134	2	4 18 17.91	2.2193	25 32 6.5	3.572
3	2 36 13.62	2.1105	20 31 2.2	9.033	3	4 20 31.11	2.2205	25 35 37.0	3.444
4	2 38 20.34	2.1134	20 40 1.1	8.931	4	4 22 44.37	2.2216	25 38 59.8	3.317
5	2 40 27.23	2.1163	20 48 53.9	8.829	5	4 24 57.70	2.2227	25 42 15.0	3.189
6	2 42 34.30	2.1193	20 57 40.6	8.726	6	4 27 11.09	2.2236	25 45 22.5	3.060
7	2 44 41.54	2.1221	21 6 21.0	8.622	7	4 29 24.53	2.2245	25 48 22.2	2.931
8	2 46 48.95	2.1250	21 14 55.2	8.518	8	4 31 38.03	2.2254	25 51 14.2	2.803
9	2 48 56.54	2.1279	21 23 23.1	8.412	9	4 33 51.58	2.2262	25 53 58.6	2.675
10	2 51 4.30	2.1308	21 31 44.6	8.306	10	4 36 5.17	2.2268	25 56 35.2	2.545
11	2 53 12.23	2.1337	21 39 59.8	8.199	11	4 38 18.80	2.2274	25 59 4.0	2.416
12	2 55 20.34	2.1366	21 48 8.5	8.091	12	4 40 32.46	2.2280	26 1 25.1	2.287
13	2 57 28.62	2.1393	21 56 10.7	7.983	13	4 42 46.16	2.2285	26 3 38.4	2.157
14	2 59 37.06	2.1421	22 4 6.5	7.875	14	4 44 59.88	2.2288	26 5 43.9	2.028
15	3 1 45.67	2.1449	22 11 55.7	7.765	15	4 47 13.62	2.2292	26 7 41.7	1.898
16	3 3 54.45	2.1478	22 19 38.3	7.655	16	4 49 27.38	2.2295	26 9 31.7	1.768
17	3 6 3.40	2.1505	22 27 14.3	7.544	17	4 51 41.16	2.2297	26 11 13.9	1.638
18	3 8 12.51	2.1532	22 34 43.6	7.432	18	4 53 54.94	2.2298	26 12 48.3	1.508
19	3 10 21.78	2.1559	22 42 6.1	7.319	19	4 56 8.73	2.2298	26 14 14.9	1.378
20	3 12 31.22	2.1586	22 49 21.9	7.208	20	4 58 22.52	2.2298	26 15 33.7	1.248
21	3 14 40.81	2.1612	22 56 31.0	7.094	21	5 0 36.30	2.2297	26 16 44.7	1.118
22	3 16 50.56	2.1638	23 3 33.2	6.979	22	5 2 50.08	2.2295	26 17 47.9	0.988
23	3 19 0.47	2.1664	23 10 28.5	6.864	23	5 5 3.84	2.2293	26 18 43.3	0.858
24	3 21 10.53	2.1690	+23 17 16.9	+ 6.749	24	5 7 17.59	2.2289	+26 19 30.9	+0.728

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
		JUNE 1.		
	h m s	s	° ′ ″	″
0	5 7 17.59	2.2289	+26 19 30.9	+0.728
1	5 9 31.31	2.2285	26 20 10.7	0.598
2	5 11 45.01	2.2280	26 20 42.7	0.469
3	5 13 58.67	2.2274	26 21 7.0	0.340
4	5 16 12.30	2.2268	26 21 23.5	0.210
5	5 18 25.89	2.2262	26 21 32.2	+0.080
6	5 20 39.44	2.2253	26 21 33.1	−0.049
7	5 22 52.93	2.2244	26 21 26.3	0.178
8	5 25 6.37	2.2235	26 21 11.8	0.307
9	5 27 19.75	2.2225	26 20 49.5	0.436
10	5 29 33.07	2.2214	26 20 19.5	0.564
11	5 31 46.32	2.2203	26 19 41.8	0.693
12	5 33 59.51	2.2192	26 18 56.4	0.821
13	5 36 12.62	2.2178	26 18 3.3	0.949
14	5 38 25.65	2.2164	26 17 2.5	1.078
15	5 40 38.59	2.2149	26 15 54.0	1.205
16	5 42 51.44	2.2135	26 14 37.9	1.332
17	5 45 4.21	2.2120	26 13 14.2	1.458
18	5 47 16.88	2.2103	26 11 42.9	1.585
19	5 49 29.44	2.2085	26 10 4.0	1.712
20	5 51 41.90	2.2068	26 8 17.5	1.838
21	5 53 54.25	2.2049	26 6 23.5	1.963
22	5 56 6.49	2.2031	26 4 21.9	2.089
23	5 58 18.62	2.2011	+26 2 12.8	−2.214
		JUNE 2.		
0	6 0 30.62	2.1990	+25 59 56.2	−2.338
1	6 2 42.50	2.1969	25 57 32.2	2.463
2	6 4 54.25	2.1948	25 55 0.7	2.587
3	6 7 5.87	2.1926	25 52 21.8	2.709
4	6 9 17.36	2.1903	25 49 35.6	2.832
5	6 11 28.71	2.1879	25 46 42.0	2.955
6	6 13 39.91	2.1855	25 43 41.0	3.078
7	6 15 50.97	2.1831	25 40 32.7	3.198
8	6 18 1.88	2.1806	25 37 17.2	3.319
9	6 20 12.64	2.1780	25 33 54.4	3.441
10	6 22 23.24	2.1754	25 30 24.3	3.561
11	6 24 33.69	2.1728	25 26 47.1	3.680
12	6 26 43.97	2.1700	25 23 2.7	3.799
13	6 28 54.09	2.1673	25 19 11.2	3.918
14	6 31 4.04	2.1644	25 15 12.6	4.036
15	6 33 13.82	2.1616	25 11 6.9	4.153
16	6 35 23.43	2.1588	25 6 51.2	4.270
17	6 37 32.87	2.1558	25 2 34.5	4.387
18	6 39 42.12	2.1528	24 58 7.8	4.503
19	6 41 51.20	2.1498	24 53 34.2	4.618
20	6 44 0.09	2.1467	24 48 53.7	4.733
21	6 46 8.80	2.1436	24 44 6.3	4.847
22	6 48 17.32	2.1404	24 39 12.1	4.960
23	6 50 25.65	2.1372	24 34 11.1	5.073
24	6 52 33.78	2.1339	+24 29 3.3	−5.186

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
		JUNE 3.		
	h m s	s	° ′ ″	″
0	6 52 33.78	2.1339	+24 29 3.3	−5.186
1	6 54 41.72	2.1308	24 23 48.8	5.298
2	6 56 49.47	2.1275	24 18 27.6	5.408
3	6 58 57.02	2.1241	24 12 59.8	5.518
4	7 1 4.36	2.1208	24 7 25.4	5.628
5	7 3 11.51	2.1174	24 1 44.4	5.738
6	7 5 18.45	2.1140	23 55 56.9	5.846
7	7 7 25.19	2.1106	23 50 2.9	5.953
8	7 9 31.72	2.1071	23 44 2.5	6.061
9	7 11 38.04	2.1036	23 37 55.6	6.168
10	7 13 44.15	2.1002	23 31 42.4	6.273
11	7 15 50.06	2.0967	23 25 22.8	6.378
12	7 17 55.75	2.0931	23 18 57.0	6.483
13	7 20 1.23	2.0896	23 12 24.9	6.587
14	7 22 6.50	2.0860	23 5 46.6	6.689
15	7 24 11.55	2.0824	22 59 2.2	6.792
16	7 26 16.39	2.0788	22 52 11.6	6.893
17	7 28 21.01	2.0753	22 45 15.0	6.993
18	7 30 25.42	2.0717	22 38 12.4	7.094
19	7 32 29.61	2.0680	22 31 3.7	7.194
20	7 34 33.58	2.0644	22 23 49.1	7.293
21	7 36 37.34	2.0608	22 16 28.5	7.392
22	7 38 40.88	2.0572	22 9 2.1	7.489
23	7 40 44.20	2.0536	+22 1 29.9	−7.585
		JUNE 4.		
0	7 42 47.31	2.0500	+21 53 51.9	−7.682
1	7 44 50.20	2.0463	21 46 8.1	7.777
2	7 46 52.87	2.0427	21 38 18.7	7.871
3	7 48 55.32	2.0390	21 30 23.6	7.965
4	7 50 57.55	2.0354	21 22 22.9	8.058
5	7 52 59.57	2.0318	21 14 16.6	8.150
6	7 55 1.37	2.0283	21 6 4.9	8.242
7	7 57 2.96	2.0247	20 57 47.6	8.333
8	7 59 4.33	2.0210	20 49 24.9	8.423
9	8 1 5.48	2.0174	20 40 56.8	8.513
10	8 3 6.42	2.0139	20 32 23.4	8.601
11	8 5 7.15	2.0103	20 23 44.7	8.689
12	8 7 7.66	2.0068	20 15 0.7	8.776
13	8 9 7.96	2.0033	20 6 11.4	8.864
14	8 11 8.05	1.9998	19 57 17.0	8.949
15	8 13 7.93	1.9963	19 48 17.5	9.034
16	8 15 7.60	1.9928	19 39 12.9	9.118
17	8 17 7.07	1.9894	19 30 3.3	9.203
18	8 19 6.33	1.9859	19 20 48.6	9.286
19	8 21 5.38	1.9825	19 11 29.0	9.368
20	8 23 4.23	1.9791	19 2 4.5	9.449
21	8 25 2.87	1.9758	18 52 35.1	9.530
22	8 27 1.32	1.9725	18 43 0.9	9.609
23	8 28 59.57	1.9692	18 33 22.0	9.688
24	8 30 57.62	1.9658	+18 23 38.3	−9.768

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JUNE 5.					JUNE 7.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	8 30 57.62	1.9658	+18 23 38.3	− 9.768	0	10 2 18.18	1.8591	+9 17 37.8	−12.720
1	8 32 55.47	1.9626	18 13 49.9	9.845	1	10 4 9.70	1.8582	9 4 53.2	12.765
2	8 34 53.13	1.9594	18 3 56.9	9.923	2	10 6 1.16	1.8573	8 52 6.0	12.809
3	8 36 50.60	1.9563	17 53 59.2	9.999	3	10 7 52.58	1.8567	8 39 16.1	12.853
4	8 38 47.88	1.9531	17 43 57.0	10.074	4	10 9 43.96	1.8560	8 26 23.6	12.896
5	8 40 44.97	1.9500	17 33 50.3	10.149	5	10 11 35.30	1.8553	8 13 28.6	12.938
6	8 42 41.88	1.9469	17 23 39.1	10.223	6	10 13 26.60	1.8548	8 0 31.0	12.980
7	8 44 38.60	1.9438	17 13 23.5	10.298	7	10 15 17.87	1.8543	7 47 31.0	13.021
8	8 46 35.14	1.9408	17 3 3.4	10.371	8	10 17 9.12	1.8539	7 34 28.5	13.062
9	8 48 31.49	1.9378	16 52 39.0	10.443	9	10 19 0.34	1.8535	7 21 23.6	13.102
10	8 50 27.67	1.9349	16 42 10.3	10.513	10	10 20 51.54	1.8533	7 8 16.3	13.141
11	8 52 23.68	1.9320	16 31 37.4	10.584	11	10 22 42.73	1.8531	6 55 6.7	13.178
12	8 54 19.51	1.9291	16 21 0.2	10.655	12	10 24 33.91	1.8529	6 41 54.9	13.216
13	8 56 15.17	1.9263	16 10 18.8	10.724	13	10 26 25.08	1.8528	6 28 40.8	13.253
14	8 58 10.67	1.9236	15 59 33.3	10.793	14	10 28 16.25	1.8528	6 15 24.5	13.289
15	9 0 6.00	1.9208	15 48 43.7	10.860	15	10 30 7.42	1.8529	6 2 6.1	13.325
16	9 2 1.17	1.9181	15 37 50.1	10.928	16	10 31 58.60	1.8531	5 48 45.5	13.360
17	9 3 56.17	1.9154	15 26 52.4	10.994	17	10 33 49.79	1.8533	5 35 22.9	13.394
18	9 5 51.02	1.9128	15 15 50.8	11.060	18	10 35 41.00	1.8537	5 21 58.2	13.428
19	9 7 45.71	1.9103	15 4 45.2	11.125	19	10 37 32.23	1.8540	5 8 31.5	13.462
20	9 9 40.25	1.9078	14 53 35.8	11.189	20	10 39 23.48	1.8544	4 55 2.8	13.493
21	9 11 34.65	1.9054	14 42 22.5	11.253	21	10 41 14.76	1.8550	4 41 32.3	13.524
22	9 13 28.90	1.9029	14 31 5.4	11.317	22	10 43 6.08	1.8556	4 27 59.9	13.555
23	9 15 23.00	1.9005	+14 19 44.5	−11.379	23	10 44 57.43	1.8562	+4 14 25.7	−13.585
	JUNE 6.					JUNE 8.			
0	9 17 16.96	1.8982	+14 8 19.9	−11.441	0	10 46 48.82	1.8569	+4 0 49.7	−13.614
1	9 19 10.78	1.8959	13 56 51.6	11.502	1	10 48 40.26	1.8578	3 47 12.0	13.643
2	9 21 4.47	1.8938	13 45 19.7	11.562	2	10 50 31.75	1.8587	3 33 32.5	13.672
3	9 22 58.03	1.8916	13 33 44.2	11.622	3	10 52 23.30	1.8597	3 19 51.4	13.698
4	9 24 51.46	1.8894	13 22 5.1	11.681	4	10 54 14.91	1.8607	3 6 8.7	13.725
5	9 26 44.76	1.8873	13 10 22.5	11.739	5	10 56 6.58	1.8618	2 52 24.4	13.752
6	9 28 37.94	1.8853	12 58 36.4	11.797	6	10 57 58.32	1.8630	2 38 38.5	13.777
7	9 30 31.00	1.8834	12 46 46.9	11.853	7	10 59 50.14	1.8643	2 24 51.2	13.800
8	9 32 23.95	1.8815	12 34 54.0	11.910	8	11 1 42.03	1.8656	2 11 2.5	13.823
9	9 34 16.78	1.8796	12 22 57.7	11.966	9	11 3 34.01	1.8670	1 57 12.4	13.847
10	9 36 9.50	1.8778	12 10 58.1	12.021	10	11 5 26.07	1.8685	1 43 20.9	13.869
11	9 38 2.12	1.8762	11 58 55.2	12.075	11	11 7 18.23	1.8702	1 29 28.1	13.891
12	9 39 54.64	1.8745	11 46 49.1	12.128	12	11 9 10.49	1.8718	1 15 34.0	13.912
13	9 41 47.06	1.8729	11 34 39.8	12.181	13	11 11 2.85	1.8736	1 1 38.7	13.931
14	9 43 39.39	1.8713	11 22 27.4	12.233	14	11 12 55.32	1.8754	0 47 42.3	13.950
15	9 45 31.62	1.8698	11 10 11.8	12.286	15	11 14 47.90	1.8773	0 33 44.7	13.968
16	9 47 23.76	1.8683	10 57 53.1	12.337	16	11 16 40.59	1.8793	0 19 46.1	13.985
17	9 49 15.82	1.8670	10 45 31.4	12.387	17	11 18 33.41	1.8813	+0 5 46.5	14.003
18	9 51 7.80	1.8657	10 33 6.7	12.436	18	11 20 26.35	1.8835	−0 8 14.2	14.019
19	9 52 59.70	1.8644	10 20 39.1	12.485	19	11 22 19.43	1.8858	0 22 15.8	14.033
20	9 54 51.53	1.8633	10 8 8.5	12.534	20	11 24 12.64	1.8880	0 36 18.2	14.047
21	9 56 43.29	1.8621	9 55 35.0	12.582	21	11 26 5.99	1.8904	0 50 21.4	14.061
22	9 58 34.98	1.8610	9 42 58.7	12.628	22	11 27 59.49	1.8929	1 4 25.5	14.074
23	10 0 26.61	1.8600	9 30 19.6	12.674	23	11 29 53.14	1.8955	1 18 30.3	14.086
24	10 2 18.18	1.8591	+ 9 17 37.8	−12.720	24	11 31 46.95	1.8982	−1 32 35.8	−14.097

GREENWICH MEAN TIME.

JUNE 9.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	h m s	s	° ′ ″	″
0	11 31 46.95	1.8982	− 1 32 35.8	−14.097
1	11 33 40.92	1.9009	1 46 41.9	14.107
2	11 35 35.06	1.9038	2 0 48.6	14.116
3	11 37 29.37	1.9066	2 14 55.8	14.124
4	11 39 23.85	1.9096	2 29 3.5	14.132
5	11 41 18.52	1.9127	2 43 11.6	14.138
6	11 43 13.37	1.9158	2 57 20.0	14.143
7	11 45 8.42	1.9191	3 11 28.8	14.148
8	11 47 3.66	1.9223	3 25 37.8	14.153
9	11 48 59.10	1.9258	3 39 47.1	14.156
10	11 50 54.75	1.9293	3 53 56.5	14.157
11	11 52 50.61	1.9328	4 8 5.9	14.158
12	11 54 46.69	1.9366	4 22 15.4	14.158
13	11 56 43.00	1.9403	4 36 24.9	14.158
14	11 58 39.53	1.9441	4 50 34.3	14.155
15	12 0 36.29	1.9480	5 4 43.5	14.152
16	12 2 33.29	1.9521	5 18 52.5	14.148
17	12 4 30.54	1.9563	5 33 1.2	14.143
18	12 6 28.04	1.9604	5 47 9.6	14.138
19	12 8 25.79	1.9647	6 1 17.7	14.131
20	12 10 23.80	1.9691	6 15 25.3	14.122
21	12 12 22.08	1.9736	6 29 32.3	14.113
22	12 14 20.63	1.9781	6 43 38.8	14.103
23	12 16 19.45	1.9827	− 6 57 44.7	−14.092

JUNE 10.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	h m s	s	° ′ ″	″
0	12 18 18.55	1.9874	− 7 11 49.8	−14.078
1	12 20 17.94	1.9923	7 25 54.1	14.065
2	12 22 17.62	1.9971	7 39 57.6	14.050
3	12 24 17.59	2.0021	7 54 0.1	14.034
4	12 26 17.87	2.0072	8 8 1.7	14.018
5	12 28 18.45	2.0123	8 22 2.2	13.999
6	12 30 19.35	2.0176	8 36 1.6	13.980
7	12 32 20.56	2.0229	8 49 59.8	13.959
8	12 34 22.10	2.0283	9 3 56.7	13.937
9	12 36 23.96	2.0338	9 17 52.2	13.913
10	12 38 26.16	2.0395	9 31 46.3	13.889
11	12 40 28.70	2.0452	9 45 38.9	13.864
12	12 42 31.58	2.0509	9 59 30.0	13.838
13	12 44 34.81	2.0568	10 13 19.4	13.809
14	12 46 38.39	2.0627	10 27 7.1	13.779
15	12 48 42.33	2.0688	10 40 52.9	13.748
16	12 50 46.64	2.0748	10 54 36.9	13.717
17	12 52 51.31	2.0810	11 8 18.9	13.683
18	12 54 56.36	2.0873	11 21 58.8	13.647
19	12 57 1.79	2.0937	11 35 36.5	13.611
20	12 59 7.60	2.1001	11 49 12.1	13.574
21	13 1 13.80	2.1066	12 2 45.4	13.534
22	13 3 20.39	2.1132	12 16 16.2	13.493
23	13 5 27.38	2.1199	12 29 44.5	13.451
24	13 7 34.78	2.1267	−12 43 10.3	−13.408

JUNE 11.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	h m s	s	° ′ ″	″
0	13 7 34.78	2.1267	−12 43 10.3	−13.408
1	13 9 42.58	2.1335	12 56 33.4	13.363
2	13 11 50.80	2.1405	13 9 53.8	13.316
3	13 13 59.44	2.1475	13 23 11.3	13.267
4	13 16 8.50	2.1545	13 36 25.8	13.217
5	13 18 17.98	2.1617	13 49 37.3	13.166
6	13 20 27.90	2.1689	14 2 45.7	13.113
7	13 22 38.25	2.1762	14 15 50.9	13.059
8	13 24 49.04	2.1836	14 28 52.8	13.003
9	13 27 0.28	2.1911	14 41 51.2	12.944
10	13 29 11.97	2.1986	14 54 46.1	12.885
11	13 31 24.11	2.2061	15 7 37.4	12.825
12	13 33 36.70	2.2138	15 20 24.9	12.763
13	13 35 49.76	2.2215	15 33 8.6	12.696
14	13 38 3.28	2.2293	15 45 48.4	12.630
15	13 40 17.27	2.2371	15 58 24.2	12.562
16	13 42 31.73	2.2450	16 10 55.8	12.492
17	13 44 46.67	2.2530	16 23 23.2	12.421
18	13 47 2.09	2.2610	16 35 46.3	12.348
19	13 49 17.99	2.2691	16 48 4.9	12.273
20	13 51 34.38	2.2773	17 0 18.9	12.196
21	13 53 51.26	2.2854	17 12 28.3	12.117
22	13 56 8.63	2.2937	17 24 32.9	12.038
23	13 58 26.50	2.3019	−17 36 32.6	−11.953

JUNE 12.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	h m s	s	° ′ ″	″
0	14 0 44.86	2.3102	−17 48 27.3	−11.869
1	14 3 3.72	2.3186	18 0 16.9	11.783
2	14 5 23.09	2.3271	18 12 1.2	11.694
3	14 7 42.97	2.3355	18 23 40.2	11.606
4	14 10 3.35	2.3440	18 35 13.7	11.512
5	14 12 24.25	2.3526	18 46 41.6	11.418
6	14 14 45.66	2.3611	18 58 3.9	11.323
7	14 17 7.58	2.3697	19 9 20.3	11.224
8	14 19 30.02	2.3783	19 20 30.8	11.124
9	14 21 52.98	2.3869	19 31 35.2	11.023
10	14 24 16.45	2.3955	19 42 33.5	10.919
11	14 26 40.44	2.4043	19 53 25.5	10.813
12	14 29 4.96	2.4130	20 4 11.1	10.706
13	14 31 30.00	2.4217	20 14 50.2	10.596
14	14 33 55.56	2.4303	20 25 22.6	10.483
15	14 36 21.64	2.4390	20 35 48.2	10.369
16	14 38 48.24	2.4478	20 46 6.9	10.253
17	14 41 15.37	2.4565	20 56 18.6	10.136
18	14 43 43.02	2.4652	21 6 23.2	10.016
19	14 46 11.19	2.4738	21 16 20.5	9.893
20	14 48 39.88	2.4825	21 26 10.4	9.769
21	14 51 9.09	2.4912	21 35 52.8	9.643
22	14 53 38.82	2.4998	21 45 27.6	9.515
23	14 56 9.07	2.5084	21 54 54.6	9.385
24	14 58 39.83	2.5170	−22 4 13.8	− 9.253

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JUNE 13.					JUNE 15.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	14 58 39.83	2.5170	−22 4 13.8	−9.253	0	17 7 45.96	2.8094	−26 20 23.4	−0.827
1	15 1 11.11	2.5256	22 13 25.0	9.119	1	17 10 34.59	2.8114	26 21 6.8	0.621
2	15 3 42.90	2.5341	22 22 28.1	8.983	2	17 13 23.33	2.8132	26 21 37.9	0.415
3	15 6 15.20	2.5426	22 31 22.9	8.843	3	17 16 12.17	2.8148	26 21 56.6	0.209
4	15 8 48.01	2.5510	22 40 9.3	8.703	4	17 19 1.10	2.8160	26 22 3.0	−0.003
5	15 11 21.32	2.5593	22 48 47.3	8.561	5	17 21 50.09	2.8170	26 21 56.9	+0.205
6	15 13 55.13	2.5677	22 57 16.6	8.416	6	17 24 39.14	2.8178	26 21 38.4	0.412
7	15 16 29.44	2.5759	23 5 37.2	8.270	7	17 27 28.23	2.8184	26 21 7.5	0.618
8	15 19 4.24	2.5841	23 13 49.0	8.122	8	17 30 17.35	2.8189	26 20 24.2	0.826
9	15 21 39.53	2.5922	23 21 51.8	7.971	9	17 33 6.50	2.8191	26 19 28.4	1.033
10	15 24 15.30	2.6003	23 29 45.5	7.818	10	17 35 55.64	2.8190	26 18 20.2	1.241
11	15 26 51.56	2.6083	23 37 30.0	7.663	11	17 38 44.78	2.8188	26 16 59.5	1.448
12	15 29 28.29	2.6162	23 45 5.1	7.508	12	17 41 33.90	2.8183	26 15 26.4	1.655
13	15 32 5.50	2.6240	23 52 30.9	7.350	13	17 44 22.98	2.8176	26 13 40.9	1.863
14	15 34 43.17	2.6317	23 59 47.1	7.189	14	17 47 12.01	2.8167	26 11 42.9	2.069
15	15 37 21.30	2.6393	24 6 53.6	7.027	15	17 50 0.98	2.8156	26 9 32.6	2.275
16	15 39 59.89	2.6468	24 13 50.3	6.863	16	17 52 49.88	2.8143	26 7 9.9	2.481
17	15 42 38.92	2.6543	24 20 37.2	6.698	17	17 55 38.69	2.8127	26 4 34.9	2.686
18	15 45 18.40	2.6616	24 27 14.1	6.531	18	17 58 27.40	2.8108	26 1 47.6	2.891
19	15 47 58.31	2.6688	24 33 40.9	6.361	19	18 1 15.99	2.8088	25 58 48.0	3.095
20	15 50 38.66	2.6759	24 39 57.4	6.189	20	18 4 4.45	2.8065	25 55 36.2	3.298
21	15 53 19.42	2.6828	24 46 3.6	6.017	21	18 6 52.77	2.8042	25 52 12.2	3.502
22	15 56 0.60	2.6898	24 51 59.4	5.843	22	18 9 40.95	2.8016	25 48 36.0	3.704
23	15 58 42.19	2.6964	−24 57 44.7	−5.667	23	18 12 28.96	2.7988	−25 44 47.7	+3.905
	JUNE 14.					JUNE 16.			
0	16 1 24.17	2.7029	−25 3 19.4	−5.489	0	18 15 16.80	2.7957	−25 40 47.4	+4.106
1	16 4 6.54	2.7093	25 8 43.4	5.309	1	18 18 4.44	2.7924	25 36 35.0	4.306
2	16 6 49.29	2.7157	25 13 56.5	5.128	2	18 20 51.89	2.7891	25 32 10.7	4.504
3	16 9 32.42	2.7218	25 18 58.7	4.945	3	18 23 39.13	2.7854	25 27 34.5	4.703
4	16 12 15.91	2.7278	25 23 49.9	4.761	4	18 26 26.14	2.7816	25 22 46.4	4.899
5	16 14 59.75	2.7336	25 28 30.0	4.575	5	18 29 12.92	2.7776	25 17 46.6	5.094
6	16 17 43.94	2.7393	25 32 58.9	4.388	6	18 31 59.45	2.7734	25 12 35.1	5.289
7	16 20 28.46	2.7448	25 37 16.5	4.199	7	18 34 45.73	2.7691	25 7 11.9	5.483
8	16 23 13.31	2.7501	25 41 22.8	4.010	8	18 37 31.74	2.7646	25 1 37.2	5.673
9	16 25 58.47	2.7552	25 45 17.7	3.819	9	18 40 17.48	2.7599	24 55 51.1	5.864
10	16 28 43.93	2.7602	25 49 1.1	3.627	10	18 43 2.93	2.7551	24 49 53.5	6.054
11	16 31 29.69	2.7650	25 52 32.9	3.433	11	18 45 48.09	2.7501	24 43 44.6	6.242
12	16 34 15.73	2.7696	25 55 53.0	3.238	12	18 48 32.94	2.7448	24 37 24.5	6.428
13	16 37 2.04	2.7740	25 59 1.4	3.042	13	18 51 17.47	2.7394	24 30 53.2	6.613
14	16 39 48.61	2.7783	26 1 58.0	2.845	14	18 54 1.67	2.7339	24 24 10.9	6.796
15	16 42 35.43	2.7823	26 4 42.8	2.647	15	18 56 45.54	2.7283	24 17 17.7	6.978
16	16 45 22.49	2.7862	26 7 15.6	2.448	16	18 59 29.06	2.7224	24 10 13.6	7.158
17	16 48 9.77	2.7898	26 9 36.5	2.248	17	19 2 12.23	2.7166	24 2 58.7	7.338
18	16 50 57.26	2.7932	26 11 45.3	2.047	18	19 4 55.05	2.7106	23 55 33.1	7.514
19	16 53 44.95	2.7964	26 13 42.1	1.846	19	19 7 37.50	2.7043	23 47 57.0	7.689
20	16 56 32.83	2.7994	26 15 26.8	1.643	20	19 10 19.57	2.6980	23 40 10.4	7.863
21	16 59 20.88	2.8022	26 16 59.3	1.440	21	19 13 1.26	2.6917	23 32 13.5	8.034
22	17 2 9.09	2.8048	26 18 19.6	1.236	22	19 15 42.57	2.6852	23 24 6.3	8.204
23	17 4 57.46	2.8073	26 19 27.6	1.032	23	19 18 23.48	2.6784	23 15 49.0	8.373
24	17 7 45.96	2.8094	−26 20 23.4	−0.827	24	19 21 3.98	2.6716	−23 7 21.6	+8.539

MOON, 1916.

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
			JUNE 17.					JUNE 19.	
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	19 21 3.98	2.6716	−23 7 21.6	+ 8.539	0	21 20 32.32	2.3048	−13 45 9.8	+14.071
1	19 23 44.07	2.6648	22 58 44.3	8.703	1	21 22 50.39	2.2977	13 31 3.6	14.135
2	19 26 23.75	2.6578	22 49 57.2	8.865	2	21 25 8.04	2.2907	13 16 53.6	14.198
3	19 29 3.01	2.6508	22 41 0.5	9.025	3	21 27 25.27	2.2837	13 2 39.9	14.258
4	19 31 41.84	2.6436	22 31 54.2	9.184	4	21 29 42.08	2.2768	12 48 22.7	14.315
5	19 34 20.24	2.6363	22 22 38.4	9.341	5	21 31 58.48	2.2699	12 34 2.1	14.372
6	19 36 58.20	2.6291	22 13 13.3	9.495	6	21 34 14.47	2.2632	12 19 38.1	14.427
7	19 39 35.73	2.6218	22 3 39.0	9.648	7	21 36 30.06	2.2564	12 5 10.9	14.479
8	19 42 12.81	2.6143	21 53 55.5	9.799	8	21 38 45.24	2.2497	11 50 40.6	14.530
9	19 44 49.44	2.6068	21 44 3.1	9.947	9	21 41 0.02	2.2432	11 36 7.3	14.579
10	19 47 25.62	2.5992	21 34 1.9	10.093	10	21 43 14.42	2.2368	11 21 31.1	14.626
11	19 50 1.34	2.5915	21 23 51.9	10.238	11	21 45 28.43	2.2303	11 6 52.2	14.671
12	19 52 36.60	2.5838	21 13 33.4	10.379	12	21 47 42.06	2.2240	10 52 10.6	14.715
13	19 55 11.40	2.5761	21 3 6.4	10.519	13	21 49 55.31	2.2178	10 37 26.4	14.757
14	19 57 45.73	2.5683	20 52 31.1	10.658	14	21 52 8.19	2.2116	10 22 39.8	14.796
15	20 0 19.60	2.5606	20 41 47.5	10.793	15	21 54 20.70	2.2055	10 7 50.9	14.834
16	20 2 53.00	2.5528	20 30 55.9	10.927	16	21 56 32.85	2.1994	9 52 59.7	14.871
17	20 5 25.93	2.5448	20 19 56.3	11.058	17	21 58 44.63	2.1934	9 38 6.4	14.906
18	20 7 58.38	2.5369	20 8 48.9	11.188	18	22 0 56.06	2.1877	9 23 11.0	14.939
19	20 10 30.36	2.5290	19 57 33.8	11.315	19	22 3 7.15	2.1819	9 8 13.7	14.971
20	20 13 1.86	2.5211	19 46 11.1	11.440	20	22 5 17.89	2.1762	8 53 14.5	15.001
21	20 15 32.89	2.5132	19 34 41.0	11.563	21	22 7 28.29	2.1706	8 38 13.6	15.029
22	20 18 3.44	2.5052	19 23 3.6	11.683	22	22 9 38.36	2.1651	8 23 11.0	15.056
23	20 20 33.51	2.4972	−19 11 19.0	+11.803	23	22 11 48.10	2.1597	− 8 8 6.9	+15.080
			JUNE 18.					JUNE 20.	
0	20 23 3.10	2.4892	−18 59 27.3	+11.919	0	22 13 57.52	2.1543	− 7 53 1.4	+15.103
1	20 25 32.21	2.4813	18 47 28.7	12.033	1	22 16 6.62	2.1491	7 37 54.5	15.125
2	20 28 0.85	2.4733	18 35 23.4	12.144	2	22 18 15.41	2.1439	7 22 46.4	15.145
3	20 30 29.00	2.4653	18 23 11.4	12.254	3	22 20 23.89	2.1388	7 7 37.1	15.164
4	20 32 56.68	2.4573	18 10 52.9	12.362	4	22 22 32.06	2.1338	6 52 26.7	15.182
5	20 35 23.88	2.4494	17 58 28.0	12.468	5	22 24 39.94	2.1289	6 37 15.3	15.198
6	20 37 50.61	2.4415	17 45 56.8	12.571	6	22 26 47.53	2.1241	6 22 3.0	15.212
7	20 40 16.86	2.4336	17 33 19.5	12.672	7	22 28 54.83	2.1193	6 6 49.9	15.224
8	20 42 42.64	2.4258	17 20 36.2	12.771	8	22 31 1.85	2.1147	5 51 36.1	15.235
9	20 45 7.95	2.4178	17 7 47.0	12.868	9	22 33 8.59	2.1101	5 36 21.7	15.245
10	20 47 32.78	2.4099	16 54 52.1	12.963	10	22 35 15.06	2.1057	5 21 6.7	15.254
11	20 49 57.14	2.4022	16 41 51.5	13.055	11	22 37 21.27	2.1013	5 5 51.2	15.261
12	20 52 21.04	2.3944	16 28 45.5	13.145	12	22 39 27.21	2.0969	4 50 35.4	15.266
13	20 54 44.17	2.3867	16 15 34.1	13.233	13	22 41 32.90	2.0928	4 35 19.3	15.270
14	20 57 7.44	2.3791	16 2 17.5	13.320	14	22 43 38.34	2.0887	4 20 3.0	15.273
15	20 59 29.96	2.3714	15 48 55.7	13.405	15	22 45 43.54	2.0847	4 4 46.6	15.274
16	21 1 52.01	2.3638	15 35 28.9	13.487	16	22 47 48.50	2.0807	3 49 30.1	15.275
17	21 4 13.61	2.3563	15 21 57.3	13.567	17	22 49 53.22	2.0768	3 34 13.6	15.273
18	21 6 34.76	2.3488	15 8 20.9	13.645	18	22 51 57.72	2.0731	3 18 57.3	15.270
19	21 8 55.46	2.3413	14 54 39.9	13.721	19	22 54 1.99	2.0694	3 3 41.2	15.267
20	21 11 15.71	2.3338	14 40 51.4	13.795	20	22 56 6.05	2.0658	2 48 25.3	15.262
21	21 13 35.52	2.3265	14 27 4.5	13.867	21	22 58 9.89	2.0623	2 33 9.8	15.255
22	21 15 54.89	2.3192	14 13 10.4	13.937	22	23 0 13.53	2.0589	2 17 54.7	15.248
23	21 18 13.82	2.3119	13 59 12.1	14.005	23	23 2 16.96	2.0556	2 2 40.1	15.239
24	21 20 32.32	2.3048	−13 45 9.8	+14.071	24	23 4 20.20	2.0524	− 1 47 26.0	+15.229

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JUNE 21.					JUNE 23.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	23 4 20.20	2.0524	−1 47 26.0	+15.229	0	0 40 43.52	1.9940	+ 9 51 1.7	+13.494
1	23 6 23.25	2.0493	1 32 12.6	15.218	1	0 42 43.18	1.9946	10 4 29.6	13.435
2	23 8 26.11	2.0462	1 16 59.9	15.205	2	0 44 42.87	1.9952	10 17 53.9	13.375
3	23 10 28.79	2.0432	1 1 48.0	15.191	3	0 46 42.60	1.9959	10 31 14.6	13.315
4	23 12 31.29	2.0403	0 46 37.0	15.176	4	0 48 42.38	1.9968	10 44 31.7	13.254
5	23 14 33.63	2.0376	0 31 26.9	15.160	5	0 50 42.21	1.9976	10 57 45.1	13.192
6	23 16 35.80	2.0348	0 16 17.8	15.143	6	0 52 42.09	1.9985	11 10 54.7	13.128
7	23 18 37.81	2.0323	−0 1 9.8	15.124	7	0 54 42.03	1.9994	11 24 0.5	13.064
8	23 20 39.67	2.0297	+0 13 57.1	15.105	8	0 56 42.02	2.0004	11 37 2.4	12.999
9	23 22 41.37	2.0272	0 29 2.8	15.084	9	0 58 42.08	2.0016	11 50 0.4	12.934
10	23 24 42.93	2.0248	0 44 7.2	15.063	10	1 0 42.21	2.0027	12 2 54.5	12.868
11	23 26 44.35	2.0226	0 59 10.3	15.039	11	1 2 42.40	2.0038	12 15 44.6	12.801
12	23 28 45.64	2.0204	1 14 11.9	15.015	12	1 4 42.67	2.0052	12 28 30.6	12.733
13	23 30 46.80	2.0183	1 29 12.1	14.990	13	1 6 43.02	2.0064	12 41 12.5	12.664
14	23 32 47.83	2.0163	1 44 10.7	14.963	14	1 8 43.44	2.0078	12 53 50.3	12.595
15	23 34 48.75	2.0143	1 59 7.7	14.937	15	1 10 43.95	2.0092	13 6 23.9	12.524
16	23 36 49.55	2 0124	2 14 3.1	14.908	16	1 12 44.54	2.0106	13 18 53.2	12.453
17	23 38 50.24	2.0107	2 28 56.7	14.879	17	1 14 45.22	2.0122	13 31 18.3	12.382
18	23 40 50.83	2.0090	2 43 48.6	14.849	18	1 16 46.00	2.0138	13 43 39.0	12.308
19	23 42 51.32	2.0074	2 58 38.6	14.818	19	1 18 46.87	2.0153	13 55 55.3	12.234
20	23 44 51.72	2.0059	3 13 26.7	14.785	20	1 20 47 84	2.0170	14 8 7.1	12.160
21	23 46 52.03	2.0044	3 28 12.8	14.752	21	1 22 48.91	2.0188	14 20 14.5	12.086
22	23 48 52.25	2.0030	3 42 56.9	14.718	22	1 24 50.09	2.0205	14 32 17.4	12.010
23	23 50 52.39	2.0018	+3 57 38.9	+14.682	23	1 26 51.37	2.0223	+14 44 15.7	+11.933
	JUNE 22.					JUNE 24.			
0	23 52 52.46	2.0006	+4 12 18.7	+14.645	0	1 28 52.76	2.0241	+14 56 9.4	+11.856
1	23 54 52.46	1.9994	4 26 56.3	14.608	1	1 30 54.26	2.0260	15 7 58.4	11.778
2	23 56 52.39	1.9983	4 41 31.7	14.570	2	1 32 55.88	2.0279	15 19 42.7	11.699
3	23 58 52.26	1.9974	4 56 4.7	14.530	3	1 34 57.61	2.0298	15 31 22.3	11.619
4	0 0 52.08	1.9966	5 10 35.3	14.490	4	1 36 59.46	2.0319	15 42 57.0	11.538
5	0 2 51.85	1.9958	5 25 3.5	14.449	5	1 39 1.44	2.0340	15 54 26.9	11.458
6	0 4 51.57	1.9949	5 39 29.2	14.407	6	1 41 3.54	2.0361	16 5 51.9	11.376
7	0 6 51.24	1.9943	5 53 52.3	14.363	7	1 43 5.77	2.0382	16 17 12.0	11.293
8	0 8 50.88	1.9937	6 8 12.8	14.320	8	1 45 8.12	2.0403	16 28 27.1	11.209
9	0 10 50.48	1.9932	6 22 30.7	14.275	9	1 47 10.60	2.0425	16 39 37.1	11.125
10	0 12 50.06	1.9928	6 36 45.8	14.229	10	1 49 13.22	2.0448	16 50 42.1	11.040
11	0 14 49.61	1.9923	6 50 58.2	14.183	11	1 51 15.97	2.0470	17 1 41.9	10.954
12	0 16 49.14	1.9921	7 5 7.7	14.134	12	1 53 18.86	2.0493	17 12 36.6	10.868
13	0 18 48.66	1.9918	7 19 14.3	14.086	13	1 55 21.89	2.0516	17 23 26.1	10.781
14	0 20 48.16	1.9917	7 33 18.0	14.037	14	1 57 25.05	2.0539	17 34 10.3	10.693
15	0 22 47.66	1.9916	7 47 18.7	13.986	15	1 59 28.36	2.0563	17 44 49.2	10.604
16	0 24 47.15	1.9916	8 1 16.3	13.935	16	2 1 31.81	2.0588	17 55 22.8	10.514
17	0 26 46.65	1.9917	8 15 10.9	13.883	17	2 3 35.41	2.0612	18 5 50.9	10.423
18	0 28 46.15	1.9918	8 29 2.3	13.830	18	2 5 39.15	2.0636	18 16 13.6	10.333
19	0 30 45.66	1.9920	8 42 50.5	13.777	19	2 7 43.04	2.0661	18 26 30.9	10.242
20	0 32 45.19	1.9923	8 56 35.5	13.722	20	2 9 47.08	2.0686	18 36 42.6	10.149
21	0 34 44.73	1.9926	9 10 17.1	13.666	21	2 11 51.27	2.0711	18 46 48.8	10.057
22	0 36 44.30	1.9931	9 23 55.4	13.610	22	2 13 55.61	2.0736	18 56 49.4	9.963
23	0 38 43.90	1.9935	9 37 30.3	13.553	23	2 16 0.10	2.0762	19 6 44.3	9.868
24	0 40 43.52	*1.9940*	*+9 51 1.7*	*+13.494*	24	2 18 4.75	2.0788	+19 16 33.8	+9 [illegible]

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JUNE 25.					JUNE 27.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	2 18 4.75	2.0788	+19 16 33.6	+9.773	0	4 0 48.59	2.1947	+25 3 34.0	+4.463
1	2 20 9.55	2.0813	19 26 17.1	9.677	1	4 3 0.32	2.1963	25 7 58.1	4.339
2	2 22 14.51	2.0840	19 35 54.8	9.580	2	4 5 12.15	2.1979	25 12 14.7	4.215
3	2 24 19.63	2.0867	19 45 26.7	9.483	3	4 7 24.07	2.1995	25 16 23.9	4.092
4	2 26 24.91	2.0893	19 54 52.8	9.386	4	4 9 36.09	2.2011	25 20 25.7	3.968
5	2 28 30.34	2.0918	20 4 13.0	9.287	5	4 11 48.20	2.2025	25 24 20.0	3.843
6	2 30 35.93	2.0945	20 13 27.2	9.188	6	4 14 0.39	2.2038	25 28 6.9	3.718
7	2 32 41.68	2.0972	20 22 35.5	9.088	7	4 16 12.66	2.2053	25 31 46.2	3.593
8	2 34 47.59	2.0998	20 31 37.7	8.987	8	4 18 25.02	2.2066	25 35 18.0	3.468
9	2 36 53.66	2.1025	20 40 33.9	8.885	9	4 20 37.45	2.2078	25 38 42.3	3.342
10	2 38 59.89	2.1051	20 49 23.9	8.783	10	4 22 49.96	2.2090	25 41 59.0	3.215
11	2 41 6.27	2.1078	20 58 7.8	8.680	11	4 25 2.53	2.2101	25 45 8.1	3.089
12	2 43 12.82	2.1105	21 6 45.5	8.577	12	4 27 15.17	2.2112	25 48 9.7	2.963
13	2 45 19.53	2.1132	21 15 17.0	8.473	13	4 29 27.87	2.2122	25 51 3.7	2.836
14	2 47 26.40	2.1158	21 23 42.2	8.368	14	4 31 40.63	2.2131	25 53 50.0	2.708
15	2 49 33.42	2.1184	21 32 1.1	8.263	15	4 33 53.44	2.2139	25 56 28.7	2.582
16	2 51 40.61	2.1212	21 40 13.7	8.157	16	4 36 6.30	2.2147	25 58 59.8	2.454
17	2 53 47.96	2.1238	21 48 19.9	8.049	17	4 38 19.20	2.2154	26 1 23.2	2.327
18	2 55 55.46	2.1264	21 56 19.6	7.942	18	4 40 32.15	2.2162	26 3 39.0	2.199
19	2 58 3.13	2.1291	22 4 12.9	7.834	19	4 42 45.14	2.2168	26 5 47.1	2.071
20	3 0 10.95	2.1317	22 11 59.7	7.726	20	4 44 58.16	2.2173	26 7 47.5	1.943
21	3 2 18.93	2.1343	22 19 40.0	7.617	21	4 47 11.21	2.2177	26 9 40.2	1.815
22	3 4 27.06	2.1368	22 27 13.7	7.507	22	4 49 24.28	2.2181	26 11 25.3	1.688
23	3 6 35.35	2.1394	+22 34 40.8	+7.397	23	4 51 37.38	2.2184	+26 13 2.7	+1.558
	JUNE 26.					JUNE 28.			
0	3 8 43.79	2.1420	+22 42 1.3	+7.286	0	4 53 50.49	2.2187	+26 14 32.3	+1.429
1	3 10 52.39	2.1446	22 49 15.1	7.174	1	4 56 3.62	2.2188	26 15 54.2	1.302
2	3 13 1.14	2.1471	22 56 22.2	7.063	2	4 58 16.75	2.2189	26 17 8.5	1.174
3	3 15 10.04	2.1495	23 3 22.6	6.949	3	5 0 29.89	2.2190	26 18 15.1	1.045
4	3 17 19.08	2.1519	23 10 16.1	6.835	4	5 2 43.03	2.2190	26 19 13.9	0.916
5	3 19 28.27	2.1544	23 17 2.8	6.722	5	5 4 56.17	2.2189	26 20 5.0	0.788
6	3 21 37.61	2.1569	23 23 42.7	6.608	6	5 7 9.30	2.2188	26 20 48.4	0.659
7	3 23 47.10	2.1593	23 30 15.7	6.493	7	5 9 22.42	2.2185	26 21 24.1	0.531
8	3 25 56.73	2.1617	23 36 41.8	6.377	8	5 11 35.52	2.2182	26 21 52.1	0.403
9	3 28 6.50	2.1640	23 43 0.9	6.261	9	5 13 48.60	2.2178	26 22 12.4	0.274
10	3 30 16.41	2.1663	23 49 13.1	6.144	10	5 16 1.66	2.2174	26 22 25.0	0.147
11	3 32 26.46	2.1686	23 55 18.2	6.027	11	5 18 14.69	2.2168	26 22 30.0	+0.018
12	3 34 36.64	2.1708	24 1 16.3	5.910	12	5 20 27.68	2.2163	26 22 27.2	−0.111
13	3 36 46.96	2.1730	24 7 7.4	5.792	13	5 22 40.64	2.2156	26 22 16.7	0.238
14	3 38 57.40	2.1752	24 12 51.3	5.673	14	5 24 53.55	2.2148	26 21 58.6	0.366
15	3 41 7.98	2.1774	24 18 28.1	5.553	15	5 27 6.41	2.2140	26 21 32.8	0.494
16	3 43 18.69	2.1795	24 23 57.7	5.434	16	5 29 19.23	2.2132	26 20 59.3	0.623
17	3 45 29.52	2.1815	24 29 20.2	5.315	17	5 31 31.99	2.2122	26 20 18.1	0.750
18	3 47 40.47	2.1835	24 34 35.5	5.194	18	5 33 44.69	2.2112	26 19 29.3	0.877
19	3 49 51.54	2.1855	24 39 43.5	5.073	19	5 35 57.33	2.2101	26 18 32.9	1.003
20	3 52 2.73	2.1874	24 44 44.2	4.951	20	5 38 9.90	2.2089	26 17 28.9	1.130
21	3 54 14.03	2.1893	24 49 37.6	4.830	21	5 40 22.40	2.2077	26 16 17.3	1.257
22	3 56 25.44	2.1911	24 54 23.8	4.708	22	5 42 34.82	2.2063	26 14 58.1	1.383
23	*3 58 36.96*	*2.1929*	24 59 2.6	4.585	23	5 44 47.16	2.2050	26 13 31.3	1.510
24	*4 0 48.59*	*2.1947*	*+25 3 34.0*	+4.463	24	5 46 59.42	2.2036	+26 11 56.9	−1.636

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JUNE 29.					JULY 1.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	5 46 59.42	2.2036	+26 11 56.9	−1.636	0	7 30 0.93	2.0723	+22 36 21.9	−7.138
1	5 49 11.59	2.2021	26 10 15.0	1.762	1	7 32 5.16	2.0687	22 29 10.6	7.238
2	5 51 23.67	2.2005	26 8 25.5	1.887	2	7 34 9.17	2.0651	22 21 53.4	7.336
3	5 53 35.65	2.1988	26 6 28.6	2.011	3	7 36 12.97	2.0615	22 14 30.3	7.434
4	5 55 47.53	2.1972	26 4 24.2	2.136	4	7 38 16.55	2.0578	22 7 1.3	7.533
5	5 57 59.31	2.1954	26 2 12.3	2.260	5	7 40 19.91	2.0543	21 59 26.4	7.629
6	6 0 10.98	2.1936	25 59 53.0	2.384	6	7 42 23.06	2.0507	21 51 45.8	7.725
7	6 2 22.54	2.1917	25 57 26.2	2.508	7	7 44 25.99	2.0471	21 43 59.4	7.820
8	6 4 33.98	2.1897	25 54 52.0	2.632	8	7 46 28.71	2.0435	21 36 7.4	7.914
9	6 6 45.30	2.1877	25 52 10.4	2.754	9	7 48 31.21	2.0398	21 28 9.7	8.008
10	6 8 56.50	2.1857	25 49 21.5	2.877	10	7 50 33.49	2.0362	21 20 6.4	8.101
11	6 11 7.58	2.1835	25 46 25.2	2.999	11	7 52 35.55	2.0325	21 11 57.6	8.193
12	6 13 18.52	2.1813	25 43 21.6	3.121	12	7 54 37.39	2.0289	21 3 43.2	8.285
13	6 15 29.33	2.1790	25 40 10.7	3.242	13	7 56 39.02	2.0253	20 55 23.4	8.376
14	6 17 40.00	2.1767	25 36 52.6	3.363	14	7 58 40.43	2.0217	20 46 58.1	8.466
15	6 19 50.53	2.1743	25 33 27.2	3.483	15	8 0 41.62	2.0181	20 38 27.5	8.554
16	6 22 0.91	2.1718	25 29 54.6	3.603	16	8 2 42.60	2.0145	20 29 51.6	8.643
17	6 24 11.15	2.1694	25 26 14.9	3.722	17	8 4 43.36	2.0108	20 21 10.3	8.732
18	6 26 21.24	2.1669	25 22 28.0	3.841	18	8 6 43.90	2.0073	20 12 23.8	8.818
19	6 28 31.18	2.1643	25 18 34.0	3.960	19	8 8 44.23	2.0038	20 3 32.2	8.903
20	6 30 40.96	2.1617	25 14 32.8	4.078	20	8 10 44.35	2.0002	19 54 35.4	8.990
21	6 32 50.58	2.1589	25 10 24.6	4.195	21	8 12 44.25	1.9966	19 45 33.4	9.075
22	6 35 0.03	2.1562	25 6 9.4	4.312	22	8 14 43.94	1.9931	19 36 26.4	9.158
23	6 37 9.32	2.1535	+25 1 47.2	−4.428	23	8 16 43.42	1.9895	+19 27 14.4	−9.241
	JUNE 30.					JULY 2.			
0	6 39 18.45	2.1507	+24 57 18.0	−4.544	0	8 18 42.68	1.9859	+19 17 57.5	−9.323
1	6 41 27.40	2.1478	24 52 41.9	4.659	1	8 20 41.73	1.9825	19 8 35.6	9.405
2	6 43 36.18	2.1448	24 47 58.9	4.774	2	8 22 40.58	1.9791	18 59 8.9	9.485
3	6 45 44.78	2.1419	24 43 9.0	4.888	3	8 24 39.22	1.9756	18 49 37.4	9.565
4	6 47 53.21	2.1389	24 38 12.3	5.002	4	8 26 37.65	1.9721	18 40 1.1	9.645
5	6 50 1.45	2.1358	24 33 8.8	5.114	5	8 28 35.87	1.9687	18 30 20.0	9.723
6	6 52 9.51	2.1328	24 27 58.6	5.227	6	8 30 33.89	1.9653	18 20 34.3	9.801
7	6 54 17.38	2.1296	24 22 41.6	5.339	7	8 32 31.71	1.9620	18 10 43.9	9.878
8	6 56 25.06	2.1264	24 17 17.9	5.450	8	8 34 29.33	1.9586	18 0 49.0	9.953
9	6 58 32.55	2.1233	24 11 47.6	5.560	9	8 36 26.74	1.9553	17 50 49.5	10.029
10	7 0 39.85	2.1201	24 6 10.7	5.670	10	8 38 23.96	1.9520	17 40 45.5	10.104
11	7 2 46.96	2.1168	24 0 27.2	5.779	11	8 40 20.98	1.9487	17 30 37.0	10.178
12	7 4 53.87	2.1135	23 54 37.2	5.888	12	8 42 17.80	1.9454	17 20 24.2	10.250
13	7 7 0.58	2.1102	23 48 40.7	5.996	13	8 44 14.43	1.9422	17 10 7.0	10.323
14	7 9 7.09	2.1069	23 42 37.7	6.103	14	8 46 10.86	1.9390	16 59 45.4	10.395
15	7 11 13.41	2.1036	23 36 28.3	6.209	15	8 48 7.11	1.9359	16 49 19.6	10.465
16	7 13 19.52	2.1001	23 30 12.6	6.315	16	8 50 3.17	1.9328	16 38 49.6	10.535
17	7 15 25.42	2.0967	23 23 50.5	6.421	17	8 51 59.04	1.9297	16 28 15.4	10.604
18	7 17 31.12	2.0933	23 17 22.1	6.526	18	8 53 54.73	1.9267	16 17 37.1	10.673
19	7 19 36.61	2.0898	23 10 47.4	6.629	19	8 55 50.24	1.9237	16 6 54.7	10.741
20	7 21 41.90	2.0863	23 4 6.6	6.732	20	8 57 45.57	1.9207	15 56 8.2	10.808
21	7 23 46.97	2.0828	22 57 19.6	6.835	21	8 59 40.72	1.9177	15 45 17.7	10.874
22	7 25 51.83	2.0793	22 50 26.4	6.937	22	9 1 35.69	1.9148	15 34 23.3	10.939
23	7 27 56.49	2.0758	22 43 27.2	7.038	23	9 3 30.49	1.9119	15 23 25.0	11.004
24	7 30 0.93	2.0723	+22 36 21.9	−7.138	24	9 5 25.12	1.9091	+15 12 22.8	−11.068

MOON, 1916.

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JULY 3.					JULY 5.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	9 5 25.12	1.9091	+15 12 22.8	−11.068	0	10 34 42.40	1.8326	+5 21 22.1	−13.282
1	9 7 19.58	1.9063	15 1 16.8	11.132	1	10 36 32.35	1.8325	5 8 4.3	13.310
2	9 9 13.88	1.9036	14 50 7.0	11.194	2	10 38 22.30	1.8325	4 54 44.9	13.338
3	9 11 8.01	1.9008	14 38 53.5	11.256	3	10 40 12.25	1.8325	4 41 23.8	13.365
4	9 13 1.98	1.8982	14 27 36.3	11.317	4	10 42 2.20	1.8326	4 28 1.1	13.392
5	9 14 55.79	1.8955	14 16 15.5	11.377	5	10 43 52.16	1.8328	4 14 36.8	13.418
6	9 16 49.44	1.8929	14 4 51.1	11.437	6	10 45 42.13	1.8330	4 1 10.9	13.443
7	9 18 42.94	1.8904	13 53 23.1	11.495	7	10 47 32.12	1.8333	3 47 43.6	13.467
8	9 20 36.29	1.8879	13 41 51.7	11.553	8	10 49 22.12	1.8336	3 34 14.9	13.491
9	9 22 29.49	1.8855	13 30 16.8	11.610	9	10 51 12.15	1.8341	3 20 44.7	13.514
10	9 24 22.55	1.8832	13 18 38.5	11.667	10	10 53 2.21	1.8346	3 7 13.2	13.536
11	9 26 15.47	1.8808	13 6 56.8	11.723	11	10 54 52.30	1.8352	2 53 40.4	13.558
12	9 28 8.24	1.8784	12 55 11.8	11.778	12	10 56 42.43	1.8358	2 40 6.3	13.578
13	9 30 0.88	1.8763	12 43 23.5	11.832	13	10 58 32.60	1.8365	2 26 31.0	13.598
14	9 31 53.39	1.8740	12 31 32.0	11.885	14	11 0 22.81	1.8373	2 12 54.5	13.618
15	9 33 45.76	1.8718	12 19 37.3	11.938	15	11 2 13.08	1.8383	1 59 16.9	13.637
16	9 35 38.01	1.8698	12 7 39.4	11.991	16	11 4 3.40	1.8392	1 45 38.1	13.655
17	9 37 30.13	1.8677	11 55 38.4	12.042	17	11 5 53.78	1.8402	1 31 58.3	13.671
18	9 39 22.13	1.8657	11 43 34.4	12.093	18	11 7 44.22	1.8413	1 18 17.6	13.687
19	9 41 14.01	1.8638	11 31 27.3	12.143	19	11 9 34.73	1.8424	1 4 35.9	13.703
20	9 43 5.78	1.8619	11 19 17.3	12.192	20	11 11 25.31	1.8437	0 50 53.2	13.718
21	9 44 57.44	1.8600	11 7 4.3	12.241	21	11 13 15.97	1.8450	0 37 9.7	13.732
22	9 46 48.98	1.8582	10 54 48.4	12.288	22	11 15 6.71	1.8463	0 23 25.4	13.745
23	9 48 40.42	1.8565	+10 42 29.7	−12.335	23	11 16 57.53	1.8478	+0 9 40.3	−13.758
	JULY 4.					JULY 6.			
0	9 50 31.76	1.8548	+10 30 8.2	−12.382	0	11 18 48.45	1.8494	−0 4 5.6	−13.770
1	9 52 23.00	1.8532	10 17 43.9	12.428	1	11 20 39.46	1.8510	0 17 52.1	13.781
2	9 54 14.14	1.8516	10 5 16.9	12.472	2	11 22 30.57	1.8528	0 31 39.3	13.792
3	9 56 5.19	1.8501	9 52 47.3	12.516	3	11 24 21.79	1.8545	0 45 27.1	13.801
4	9 57 56.15	1.8487	9 40 15.0	12.559	4	11 26 13.11	1.8563	0 59 15.4	13.809
5	9 59 47.03	1.8473	9 27 40.2	12.602	5	11 28 4.55	1.8583	1 13 4.2	13.818
6	10 1 37.82	1.8459	9 15 2.8	12.645	6	11 29 56.10	1.8603	1 26 53.5	13.825
7	10 3 28.54	1.8448	9 2 22.8	12.687	7	11 31 47.78	1.8624	1 40 43.2	13.831
8	10 5 19.19	1.8435	8 49 40.4	12.727	8	11 33 39.59	1.8646	1 54 33.2	13.837
9	10 7 9.76	1.8423	8 36 55.6	12.767	9	11 35 31.53	1.8668	2 8 23.6	13.842
10	10 9 0.27	1.8413	8 24 8.4	12.806	10	11 37 23.61	1.8692	2 22 14.2	13.845
11	10 10 50.71	1.8402	8 11 18.9	12.844	11	11 39 15.83	1.8716	2 36 5.0	13.848
12	10 12 41.09	1.8393	7 58 27.1	12.883	12	11 41 8.20	1.8741	2 49 56.0	13.851
13	10 14 31.42	1.8383	7 45 33.0	12.919	13	11 43 0.72	1.8766	3 3 47.1	13.852
14	10 16 21.69	1.8375	7 32 36.8	12.955	14	11 44 53.39	1.8793	3 17 38.2	13.853
15	10 18 11.92	1.8368	7 19 38.4	12.992	15	11 46 46.23	1.8820	3 31 29.4	13.853
16	10 20 2.10	1.8360	7 6 37.8	13.027	16	11 48 39.23	1.8848	3 45 20.5	13.852
17	10 21 52.24	1.8354	6 53 35.2	13.060	17	11 50 32.41	1.8878	3 59 11.6	13.850
18	10 23 42.35	1.8348	6 40 30.6	13.094	18	11 52 25.76	1.8907	4 13 2.5	13.847
19	10 25 32.42	1.8343	6 27 23.9	13.128	19	11 54 19.29	1.8938	4 26 53.2	13.843
20	10 27 22.46	1.8338	6 14 15.3	13.159	20	11 56 13.01	1.8969	4 40 43.6	13.838
21	10 29 12.47	1.8333	6 1 4.8	13.191	21	11 58 6.92	1.9001	4 54 33.8	13.833
22	10 31 2.46	1.8331	5 47 52.4	13.223	22	12 0 1.02	1.9034	5 8 23.6	13.827
23	10 32 52.44	1.8328	5 34 38.1	13.253	23	12 1 55.33	1.9068	5 22 13.0	13.820
24	10 34 42.40	1.8326	+ 5 21 22.1	−13.282	24	12 3 49.84	1.9103	−5 36 2.0	−13.812

GREENWICH MEAN TIME.

JULY 7.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	h m s	s	° ′ ″	″
0	12 3 49.84	1.9103	− 5 36 2.0	−13.812
1	12 5 44.56	1.9138	5 49 50.4	13.803
2	12 7 39.50	1.9175	6 3 38.3	13.793
3	12 9 34.66	1.9213	6 17 25.5	13.781
4	12 11 30.05	1.9251	6 31 12.0	13.769
5	12 13 25.67	1.9289	6 44 57.8	13.757
6	12 15 21.52	1.9328	6 58 42.8	13.743
7	12 17 17.61	1.9369	7 12 26.9	13.728
8	12 19 13.95	1.9411	7 26 10.1	13.712
9	12 21 10.54	1.9453	7 39 52.3	13.695
10	12 23 7.39	1.9497	7 53 33.5	13.678
11	12 25 4.50	1.9541	8 7 13.6	13.658
12	12 27 1.88	1.9586	8 20 52.5	13.638
13	12 28 59.53	1.9631	8 34 30.2	13.618
14	12 30 57.45	1.9678	8 48 6.6	13.596
15	12 32 55.66	1.9725	9 1 41.7	13.573
16	12 34 54.15	1.9773	9 15 15.3	13.548
17	12 36 52.93	1.9822	9 28 47.4	13.523
18	12 38 52.01	1.9872	9 42 18.0	13.497
19	12 40 51.39	1.9923	9 55 47.0	13.469
20	12 42 51.08	1.9974	10 9 14.3	13.441
21	12 44 51.08	2.0027	10 22 39.9	13.411
22	12 46 51.40	2.0080	10 36 3.6	13.379
23	12 48 52.04	2.0133	−10 49 25.4	−13.348

JULY 8.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
0	12 50 53.00	2.0188	−11 2 45.3	−13.315
1	12 52 54.30	2.0244	11 16 3.2	13.280
2	12 54 55.93	2.0301	11 29 18.9	13.244
3	12 56 57.91	2.0358	11 42 32.5	13.208
4	12 59 0.23	2.0417	11 55 43.9	13.170
5	13 1 2.91	2.0476	12 8 52.9	13.130
6	13 3 5.94	2.0535	12 21 59.5	13.089
7	13 5 9.33	2.0596	12 35 3.6	13.048
8	13 7 13.09	2.0658	12 48 5.2	13.005
9	13 9 17.22	2.0720	13 1 4.2	12.961
10	13 11 21.73	2.0783	13 14 0.5	12.915
11	13 13 26.62	2.0847	13 26 54.0	12.868
12	13 15 31.89	2.0911	13 39 44.6	12.819
13	13 17 37.55	2.0977	13 52 32.3	12.770
14	13 19 43.61	2.1043	14 5 17.0	12.718
15	13 21 50.07	2.1110	14 17 58.5	12.666
16	13 23 56.93	2.1178	14 30 36.9	12.613
17	13 26 4.20	2.1246	14 43 12.0	12.557
18	13 28 11.88	2.1315	14 55 43.7	12.500
19	13 30 19.98	2.1385	15 8 12.0	12.442
20	13 32 28.50	2.1456	15 20 36.7	12.382
21	13 34 37.45	2.1528	15 32 57.8	12.321
22	13 36 46.83	2.1599	15 45 15.2	12.258
23	13 38 56.64	2.1672	15 57 28.8	12.194
24	13 41 6.89	*2.1745*	*−16 9 38.5*	*−12.128*

JULY 9.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	h m s	s	° ′ ″	″
0	13 41 6.89	2.1745	−16 9 38.5	−12.128
1	13 43 17.58	2.1819	16 21 44.2	12.061
2	13 45 28.72	2.1894	16 33 45.8	11.993
3	13 47 40.31	2.1970	16 45 43.3	11.923
4	13 49 52.36	2.2046	16 57 36.5	11.850
5	13 52 4.86	2.2123	17 9 25.3	11.777
6	13 54 17.83	2.2200	17 21 9.7	11.703
7	13 56 31.26	2.2277	17 32 49.6	11.626
8	13 58 45.15	2.2355	17 44 24.8	11.547
9	14 0 59.52	2.2435	17 55 55.2	11.467
10	14 3 14.37	2.2514	18 7 20.8	11.385
11	14 5 29.69	2.2593	18 18 41.4	11.302
12	14 7 45.49	2.2674	18 29 57.0	11.217
13	14 10 1.78	2.2755	18 41 7.4	11.130
14	14 12 18.55	2.2836	18 52 12.6	11.042
15	14 14 35.81	2.2918	19 3 12.4	10.951
16	14 16 53.57	2.3001	19 14 6.7	10.859
17	14 19 11.82	2.3083	19 24 55.5	10.766
18	14 21 30.57	2.3167	19 35 38.6	10.670
19	14 23 49.82	2.3249	19 46 15.9	10.573
20	14 26 9.56	2.3333	19 56 47.4	10.474
21	14 28 29.81	2.3417	20 7 12.8	10.373
22	14 30 50.56	2.3500	20 17 32.2	10.272
23	14 33 11.81	2.3585	−20 27 45.4	−10.167

JULY 10.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
0	14 35 33.58	2.3671	−20 37 52.2	−10.060
1	14 37 55.86	2.3755	20 47 52.6	9.953
2	14 40 18.64	2.3839	20 57 46.5	9.843
3	14 42 41.93	2.3924	21 7 33.7	9.731
4	14 45 5.73	2.4010	21 17 14.2	9.618
5	14 47 30.05	2.4096	21 26 47.8	9.502
6	14 49 54.88	2.4181	21 36 14.4	9.384
7	14 52 20.22	2.4266	21 45 33.9	9.265
8	14 54 46.07	2.4351	21 54 46.2	9.144
9	14 57 12.43	2.4436	22 3 51.2	9.021
10	14 59 39.30	2.4521	22 12 48.7	8.896
11	15 2 6.68	2.4606	22 21 38.7	8.770
12	15 4 34.57	2.4691	22 30 21.1	8.642
13	15 7 2.97	2.4775	22 38 55.7	8.511
14	15 9 31.87	2.4859	22 47 22.4	8.378
15	15 12 1.28	2.4944	22 55 41.1	8.244
16	15 14 31.20	2.5028	23 3 51.7	8.108
17	15 17 1.61	2.5110	23 11 54.1	7.971
18	15 19 32.52	2.5193	23 19 48.2	7.831
19	15 22 3.93	2.5277	23 27 33.8	7.688
20	15 24 35.84	2.5358	23 35 10.8	7.545
21	15 27 8.23	2.5439	23 42 39.2	7.400
22	15 29 41.11	2.5520	23 49 58.8	7.253
23	15 32 14.47	2.5601	23 57 9.5	7.103
24	15 34 48.32	2.5681	−24 4 11.2	− 6.953

MOON, 1916.

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.
	JULY 11.					JULY 13.		
	h m s	s	° ′ ″	″		h m s	s	° ′ ″
0	15 34 48.32	2.5681	−24 4 11.2	−6.953	0	17 45 2.96	2.7970	−26 14 31.7
1	15 37 22.64	2.5760	24 11 3.8	6.800	1	17 47 50.79	2.7973	26 12 28.1
2	15 39 57.44	2.5838	24 17 47.2	6.645	2	17 50 38.63	2.7974	26 10 12.2
3	15 42 32.70	2.5916	24 24 21.2	6.488	3	17 53 26.48	2.7973	26 7 44.0
4	15 45 8.43	2.5993	24 30 45.8	6.330	4	17 56 14.31	2.7969	26 5 3.6
5	15 47 44.61	2.6068	24 37 0.8	6.170	5	17 59 2.11	2.7963	26 2 10.9
6	15 50 21.25	2.6143	24 43 6.2	6.008	6	18 1 49.87	2.7956	25 59 6.1
7	15 52 58.33	2.6217	24 49 1.8	5.845	7	18 4 37.58	2.7947	25 55 49.0
8	15 55 35.85	2.6290	24 54 47.6	5.681	8	18 7 25.23	2.7935	25 52 19.7
9	15 58 13.81	2.6363	25 0 23.5	5.514	9	18 10 12.80	2.7921	25 48 38.3
10	16 0 52.20	2.6433	25 5 49.3	5.345	10	18 13 0.28	2.7906	25 44 44.8
11	16 3 31.01	2.6503	25 11 4.9	5.175	11	18 15 47.67	2.7889	25 40 39.2
12	16 6 10.23	2.6571	25 16 10.3	5.003	12	18 18 34.95	2.7869	25 36 21.5
13	16 8 49.86	2.6639	25 21 5.3	4.830	13	18 21 22.10	2.7847	25 31 51.8
14	16 11 29.90	2.6706	25 25 49.9	4.656	14	18 24 9.11	2.7823	25 27 10.1
15	16 14 10.33	2.6771	25 30 24.0	4.479	15	18 26 55.98	2.7798	25 22 16.5
16	16 16 51.15	2.6834	25 34 47.4	4.301	16	18 29 42.69	2.7771	25 17 11.0
17	16 19 32.34	2.6896	25 39 0.1	4.122	17	18 32 29.23	2.7742	25 11 53.7
18	16 22 13.90	2.6957	25 43 2.0	3.941	18	18 35 15.59	2.7711	25 6 24.6
19	16 24 55.82	2.7017	25 46 53.0	3.758	19	18 38 1.76	2.7678	25 0 43.8
20	16 27 38.10	2.7075	25 50 33.0	3.575	20	18 40 47.73	2.7644	24 54 51.3
21	16 30 20.72	2.7131	25 54 2.0	3.391	21	18 43 33.49	2.7608	24 48 47.3
22	16 33 3.67	2.7186	25 57 19.9	3.204	22	18 46 19.03	2.7571	24 42 31.7
23	16 35 46.95	2.7239	−26 0 26.5	−3.016	23	18 49 4.34	2.7531	−24 36 4.7
	JULY 12.					JULY 14.		
0	16 38 30.54	2.7291	−26 3 21.8	−2.828	0	18 51 49.40	2.7489	−24 29 26.3
1	16 41 14.44	2.7342	26 6 5.8	2.638	1	18 54 34.21	2.7446	24 22 36.6
2	16 43 58.64	2.7390	26 8 38.3	2.446	2	18 57 18.75	2.7401	24 15 35.7
3	16 46 43.12	2.7436	26 10 59.3	2.254	3	19 0 3.02	2.7355	24 8 23.6
4	16 49 27.87	2.7480	26 13 8.8	2.061	4	19 2 47.01	2.7308	24 1 0.5
5	16 52 12.88	2.7523	26 15 6.6	1.866	5	19 5 30.71	2.7259	23 53 26.4
6	16 54 58.15	2.7565	26 16 52.7	1.671	6	19 8 14.12	2.7209	23 45 41.5
7	16 57 43.66	2.7604	26 18 27.1	1.474	7	19 10 57.22	2.7158	23 37 45.7
8	17 0 29.40	2.7642	26 19 49.6	1.277	8	19 13 40.01	2.7104	23 29 39.2
9	17 3 15.36	2.7678	26 21 0.3	1.079	9	19 16 22.47	2.7050	23 21 22.2
10	17 6 1.53	2.7711	26 21 59.1	0.881	10	19 19 4.61	2.6995	23 12 54.7
11	17 8 47.89	2.7743	26 22 46.0	0.681	11	19 21 46.41	2.6938	23 4 16.8
12	17 11 34.44	2.7773	26 23 20.8	0.480	12	19 24 27.87	2.6880	22 55 28.5
13	17 14 21.16	2.7800	26 23 43.6	0.279	13	19 27 8.97	2.6820	22 46 30.1
14	17 17 8.04	2.7826	26 23 54.3	−0.078	14	19 29 49.71	2.6760	22 37 21.6
15	17 19 55.07	2.7850	26 23 52.9	+0.124	15	19 32 30.09	2.6699	22 28 3.1
16	17 22 42.24	2.7871	26 23 39.4	0.327	16	19 35 10.10	2.6638	22 18 34.8
17	17 25 29.52	2.7890	26 23 13.7	0.529	17	19 37 49.74	2.6574	22 8 56.7
18	17 28 16.92	2.7908	26 22 35.9	0.733	18	19 40 28.99	2.6510	21 59 9.0
19	17 31 4.42	2.7923	26 21 45.8	0.937	19	19 43 7.86	2.6446	21 49 11.8
20	17 33 52.00	2.7937	26 20 43.5	1.141	20	19 45 46.34	2.6380	21 39 5.2
21	17 36 39.66	2.7948	26 19 28.9	1.345	21	19 48 24.42	2.6313	21 28 49.3
22	17 39 27.38	2.7958	26 18 2.1	1.549	22	19 51 2.10	2.6246	21 18 24.2
23	17 42 15.15	2.7965	26 16 23.0	1.753	23	19 53 39.37	2.6178	21 7 50.1
24	*17 45 2.96*	*2.7970*	*−26 14 31.7*	+1.958	24	19 56 16.23	2.6109	−20 57 7.1

GREENWICH MEAN TIME.

JULY 15.

lour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	h m s	s	° ′ ″	″
0	19 56 16.23	2.6109	−20 57 7.1	+10.790
1	19 58 52.68	2.6040	20 46 15.3	10.936
2	20 1 28.71	2.5970	20 35 14.8	11.080
3	20 4 4.32	2.5900	20 24 5.7	11.221
4	20 6 39.51	2.5830	20 12 48.3	11.359
5	20 9 14.28	2.5758	20 1 22.6	11.497
6	20 11 48.61	2.5687	19 49 48.7	11.632
7	20 14 22.52	2.5615	19 38 6.8	11.764
8	20 16 55.99	2.5543	19 26 17.0	11.894
9	20 19 29.03	2.5470	19 14 19.5	12.023
10	20 22 1.63	2.5398	19 2 14.3	12.149
11	20 24 33.80	2.5324	18 50 1.6	12.273
12	20 27 5.52	2.5250	18 37 41.6	12.394
13	20 29 36.80	2.5178	18 25 14.3	12.514
14	20 32 7.65	2.5105	18 12 39.9	12.631
15	20 34 38.06	2.5031	17 59 58.6	12.745
16	20 37 8.02	2.4957	17 47 10.5	12.858
17	20 39 37.54	2.4883	17 34 15.6	12.969
18	20 42 6.62	2.4810	17 21 14.2	13.077
19	20 44 35.26	2.4736	17 8 6.4	13.183
20	20 47 3.45	2.4663	16 54 52.3	13.287
21	20 49 31.21	2.4590	16 41 32.0	13.388
22	20 51 58.53	2.4517	16 28 5.7	13.488
23	20 54 25.41	2.4443	−16 14 33.5	+13.584

JULY 16.

lour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
0	20 56 51.85	2.4371	−16 0 55.6	+13.679
1	20 59 17.86	2.4298	15 47 12.0	13.772
2	21 1 43.43	2.4226	15 33 23.0	13.862
3	21 4 8.57	2.4154	15 19 28.6	13.950
4	21 6 33.28	2.4083	15 5 29.0	14.036
5	21 8 57.57	2.4012	14 51 24.3	14.119
6	21 11 21.42	2.3940	14 37 14.7	14.201
7	21 13 44.85	2.3871	14 23 0.2	14.280
8	21 16 7.87	2.3801	14 8 41.1	14.357
9	21 18 30.46	2.3730	13 54 17.4	14.433
10	21 20 52.63	2.3661	13 39 49.2	14.506
11	21 23 14.39	2.3593	13 25 16.7	14.576
12	21 25 35.74	2.3524	13 10 40.1	14.643
13	21 27 56.68	2.3457	12 55 59.5	14.710
14	21 30 17.22	2.3390	12 41 14.9	14.775
15	21 32 37.36	2.3323	12 26 26.5	14.837
16	21 34 57.10	2.3257	12 11 34.5	14.897
17	21 37 16.44	2.3191	11 56 38.9	14.954
18	21 39 35.39	2.3127	11 41 40.0	15.010
19	21 41 53.96	2.3063	11 26 37.7	15.064
20	21 44 12.14	2.2998	11 11 32.3	15.115
21	21 46 29.94	2.2936	10 56 23.9	15.165
22	21 48 47.37	2.2873	10 41 12.5	15.213
23	21 51 4.42	2.2812	10 25 58.3	15.258
24	21 53 21.11	2.2751	−10 10 41.5	+15.302

JULY 17.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	h m s	s	° ′ ″	″
0	21 53 21.11	2.2751	−10 10 41.5	+15.302
1	21 55 37.43	2.2691	9 55 22.1	15.343
2	21 57 53.40	2.2632	9 40 0.3	15.383
3	22 0 9.01	2.2572	9 24 36.1	15.422
4	22 2 24.26	2.2513	9 9 9.7	15.457
5	22 4 39.17	2.2457	8 53 41.3	15.490
6	22 6 53.74	2.2400	8 38 10.9	15.523
7	22 9 7.97	2.2344	8 22 38.5	15.554
8	22 11 21.87	2.2289	8 7 4.4	15.582
9	22 13 35.44	2.2235	7 51 28.7	15.608
10	22 15 48.69	2.2182	7 35 51.5	15.633
11	22 18 1.62	2.2128	7 20 12.8	15.655
12	22 20 14.23	2.2076	7 4 32.9	15.676
13	22 22 26.53	2.2025	6 48 51.7	15.695
14	22 24 38.53	2.1975	6 33 9.5	15.713
15	22 26 50.23	2.1926	6 17 26.2	15.729
16	22 29 1.64	2.1877	6 1 42.0	15.743
17	22 31 12.75	2.1828	5 45 57.1	15.754
18	22 33 23.58	2.1782	5 30 11.5	15.766
19	22 35 34.13	2.1735	5 14 25.2	15.775
20	22 37 44.40	2.1689	4 58 38.5	15.782
21	22 39 54.40	2.1645	4 42 51.4	15.788
22	22 42 4.14	2.1601	4 27 4.0	15.792
23	22 44 13.61	2.1558	− 4 11 16.4	+15.793

JULY 18.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
0	22 46 22.83	2.1516	− 3 55 28.8	+15.793
1	22 48 31.80	2.1474	3 39 41.2	15.793
2	22 50 40.52	2.1433	3 23 53.6	15.792
3	22 52 49.00	2.1394	3 8 6.2	15.788
4	22 54 57.25	2.1356	2 52 19.1	15.782
5	22 57 5.27	2.1318	2 36 32.4	15.775
6	22 59 13.06	2.1280	2 20 46.1	15.767
7	23 1 20.63	2.1243	2 5 0.4	15.757
8	23 3 27.98	2.1208	1 49 15.3	15.746
9	23 5 35.13	2.1174	1 33 30.9	15.733
10	23 7 42.07	2.1140	1 17 47.3	15.719
11	23 9 48.81	2.1107	1 2 4.6	15.703
12	23 11 55.35	2.1074	0 46 22.9	15.686
13	23 14 1.70	2.1043	0 30 42.3	15.668
14	23 16 7.87	2.1013	− 0 15 2.8	15.648
15	23 18 13.86	2.0983	+ 0 0 35.4	15.627
16	23 20 19.67	2.0955	0 16 12.4	15.605
17	23 22 25.32	2.0928	0 31 48.0	15.581
18	23 24 30.80	2.0900	0 47 22.1	15.555
19	23 26 36.12	2.0873	1 2 54.6	15.528
20	23 28 41.28	2.0848	1 18 25.5	15.502
21	23 30 46.29	2.0823	1 33 54.8	15.473
22	23 32 51.16	2.0799	1 49 22.2	15.442
23	23 34 55.88	2.0776	2 4 47.8	15.411
24	23 37 0.47	2.0754	+ 2 20 11.5	+15.378

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
		JULY 19.		
	h m s	s	° ′ ″	″
0	23 37 0.47	2.0754	+ 2 20 11.5	+15.378
1	23 39 4.93	2.0733	2 35 33.2	15.344
2	23 41 9.26	2.0712	2 50 52.8	15.309
3	23 43 13.47	2.0693	3 6 10.3	15.273
4	23 45 17.57	2.0673	3 21 25.5	15.235
5	23 47 21.55	2.0655	3 36 38.5	15.197
6	23 49 25.43	2.0638	3 51 49.1	15.157
7	23 51 29.20	2.0621	4 6 57.3	15.116
8	23 53 32.88	2.0605	4 22 3.0	15.074
9	23 55 36.46	2.0589	4 37 6.2	15.032
10	23 57 39.95	2.0575	4 52 6.8	14.988
11	23 59 43.36	2.0562	5 7 4.7	14.942
12	0 1 46.69	2.0549	5 21 59.8	14.895
13	0 3 49.95	2.0537	5 36 52.1	14.848
14	0 5 53.13	2.0525	5 51 41.5	14.799
15	0 7 56.25	2.0515	6 6 28.0	14.750
16	0 9 59.31	2.0505	6 21 11.5	14.699
17	0 12 2.31	2.0496	6 35 51.9	14.648
18	0 14 5.26	2.0488	6 50 29.2	14.595
19	0 16 8.16	2.0479	7 5 3.3	14.541
20	0 18 11.01	2.0472	7 19 34.1	14.487
21	0 20 13.82	2.0466	7 34 1.7	14.432
22	0 22 16.60	2.0460	7 48 25.9	14.375
23	0 24 19.34	2.0455	+ 8 2 46.7	+14.318
		JULY 20.		
0	0 26 22.06	2.0452	+ 8 17 4.0	+14.258
1	0 28 24.76	2.0448	8 31 17.7	14.199
2	0 30 27.44	2.0445	8 45 27.9	14.139
3	0 32 30.10	2.0443	8 59 34.4	14.078
4	0 34 32.75	2.0441	9 13 37.2	14.015
5	0 36 35.39	2.0440	9 27 36.2	13.953
6	0 38 38.03	2.0440	9 41 31.5	13.889
7	0 40 40.67	2.0441	9 55 22.9	13.823
8	0 42 43.32	2.0443	10 9 10.3	13.758
9	0 44 45.98	2.0443	10 22 53.8	13.691
10	0 46 48.64	2.0445	10 36 33.2	13.623
11	0 48 51.32	2.0448	10 50 8.6	13.555
12	0 50 54.02	2.0452	11 3 39.8	13.485
13	0 52 56.74	2.0456	11 17 6.8	13.415
14	0 54 59.49	2.0461	11 30 29.6	13.344
15	0 57 2.27	2.0466	11 43 48.1	13.273
16	0 59 5.08	2.0472	11 57 2.3	13.200
17	1 1 7.93	2.0478	12 10 12.1	13.127
18	1 3 10.82	2.0486	12 23 17.5	13.053
19	1 5 13.76	2.0493	12 36 18.4	12.977
20	1 7 16.74	2.0501	12 49 14.7	12.901
21	1 9 19.77	2.0509	13 2 6.5	12.824
22	1 11 22.85	2.0518	13 14 53.6	12.747
23	1 13 25.99	2.0528	13 27 36.1	12.668
24	*1 15 29.18*	*2.0538*	*+13* 40 13.8	+12.589

Hour.	Right Ascension.	Var. per Min.	Declination.
		JULY 21.	
	h m s	s	° ′ ″
0	1 15 29.18	2.0538	+13 40 13.8
1	1 17 32.44	2.0548	13 52 46.8
2	1 19 35.76	2.0559	14 5 14.9
3	1 21 39.15	2.0571	14 17 38.2
4	1 23 42.61	2.0583	14 29 56.6
5	1 25 46.15	2.0596	14 42 10.0
6	1 27 49.76	2.0608	14 54 18.5
7	1 29 53.45	2.0622	15 6 21.9
8	1 31 57.22	2.0636	15 18 20.2
9	1 34 1.08	2.0650	15 30 13.4
10	1 36 5.02	2.0664	15 42 1.4
11	1 38 9.05	2.0679	15 53 44.1
12	1 40 13.17	2.0694	16 5 21.6
13	1 42 17.38	2.0710	16 16 53.8
14	1 44 21.69	2.0727	16 28 20.6
15	1 46 26.10	2.0743	16 39 42.1
16	1 48 30.61	2.0760	16 50 58.1
17	1 50 35.22	2.0777	17 2 8.7
18	1 52 39.93	2.0794	17 13 13.8
19	1 54 44.75	2.0813	17 24 13.3
20	1 56 49.68	2.0831	17 35 7.2
21	1 58 54.72	2.0849	17 45 55.4
22	2 0 59.87	2.0868	17 56 37.9
23	2 3 5.13	2.0886	+18 7 14.8
		JULY 22.	
0	2 5 10.50	2.0905	+18 17 45.9
1	2 7 15.99	2.0925	18 28 11.2
2	2 9 21.60	2.0944	18 38 30.6
3	2 11 27.32	2.0964	18 48 44.2
4	2 13 33.17	2.0984	18 58 51.8
5	2 15 39.13	2.1004	19 8 53.5
6	2 17 45.22	2.1025	19 18 49.2
7	2 19 51.43	2.1046	19 28 38.9
8	2 21 57.77	2.1067	19 38 22.5
9	2 24 4.23	2.1088	19 48 0.0
10	2 26 10.82	2.1108	19 57 31.3
11	2 28 17.53	2.1129	20 6 56.4
12	2 30 24.37	2.1151	20 16 15.3
13	2 32 31.34	2.1172	20 25 28.0
14	2 34 38.43	2.1193	20 34 34.4
15	2 36 45.66	2.1215	20 43 34.4
16	2 38 53.01	2.1236	20 52 28.0
17	2 41 0.49	2.1258	21 1 15.3
18	2 43 8.10	2.1279	21 9 56.2
19	2 45 15.84	2.1302	21 18 30.6
20	2 47 23.72	2.1323	21 26 58.5
21	2 49 31.72	2.1345	21 35 19.8
22	2 51 39.86	2.1367	21 43 34.6
23	2 53 48.12	2.1388	21 51 42.8
24	2 55 56.51	2.1409	+21 59 44.3

GREENWICH MEAN TIME.

our.	Right Ascension.			Var. per Min.	Declination.			Var. per Min.
JULY 23.								
	h	m	s	s	°	'	"	"
0	2	55	56.51	2.1409	+21	59	44.3	+7.969
1	2	58	5.03	2.1431	22	7	39.1	7.858
2	3	0	13.68	2.1452	22	15	27.3	7.747
3	3	2	22.45	2.1473	22	23	8.7	7.634
4	3	4	31.35	2.1494	22	30	43.4	7.522
5	3	6	40.38	2.1516	22	38	11.3	7.408
6	3	8	49.54	2.1537	22	45	32.4	7.294
7	3	10	58.82	2.1558	22	52	46.6	7.179
8	3	13	8.23	2.1578	22	59	53.9	7.064
9	3	15	17.76	2.1598	23	6	54.3	6.949
10	3	17	27.41	2.1618	23	13	47.8	6.833
11	3	19	37.18	2.1638	23	20	34.3	6.718
12	3	21	47.07	2.1658	23	27	13.9	6.601
13	3	23	57.08	2.1678	23	33	46.4	6.483
14	3	26	7.21	2.1698	23	40	11.8	6.365
15	3	28	17.45	2.1716	23	46	30.2	6.248
16	3	30	27.80	2.1735	23	52	41.5	6.128
17	3	32	38.27	2.1754	23	58	45.6	6.009
18	3	34	48.85	2.1773	24	4	42.6	5.890
19	3	36	59.54	2.1791	24	10	32.4	5.770
20	3	39	10.34	2.1808	24	16	15.0	5.650
21	3	41	21.24	2.1825	24	21	50.4	5.529
22	3	43	32.24	2.1843	24	27	18.5	5.408
23	3	45	43.35	2.1859	+24	32	39.3	+5.287
JULY 24.								
0	3	47	54.55	2.1875	+24	37	52.9	+5.166
1	3	50	5.85	2.1892	24	42	59.2	5.043
2	3	52	17.25	2.1908	24	47	58.1	4.920
3	3	54	28.74	2.1923	24	52	49.6	4.797
4	3	56	40.32	2.1937	24	57	33.7	4.674
5	3	58	51.98	2.1951	25	2	10.5	4.551
6	4	1	3.73	2.1965	25	6	39.8	4.427
7	4	3	15.56	2.1979	25	11	1.7	4.303
8	4	5	27.48	2.1993	25	15	16.1	4.178
9	4	7	39.47	2.2004	25	19	23.1	4.054
10	4	9	51.53	2.2017	25	23	22.6	3.929
11	4	12	3.67	2.2029	25	27	14.6	3.803
12	4	14	15.88	2.2040	25	30	59.0	3.678
13	4	16	28.15	2.2050	25	34	35.9	3.553
14	4	18	40.48	2.2061	25	38	5.3	3.428
15	4	20	52.88	2.2071	25	41	27.2	3.301
16	4	23	5.33	2.2079	25	44	41.4	3.174
17	4	25	17.83	2.2088	25	47	48.1	3.048
18	4	27	30.38	2.2096	25	50	47.2	2.922
19	4	29	42.98	2.2103	25	53	38.7	2.795
20	4	31	55.62	2.2110	25	56	22.6	2.668
21	4	34	8.30	2.2117	25	58	58.8	2.540
22	4	36	21.02	2.2123	26	1	27.4	2.413
23	4	38	33.77	2.2128	26	3	48.4	2.286
24	4	40	46.55	2.2132	+26	6	1.7	+2.158

Hour.	Right Ascension.			Var. per Min.	Declination.			Var. per Min.
JULY 25.								
	h	m	s	s	°	'	"	"
0	4	40	46.55	2.2132	+26	6	1.7	+2.158
1	4	42	59.35	2.2136	26	8	7.4	2.031
2	4	45	12.18	2.2140	26	10	5.4	1.903
3	4	47	25.03	2.2143	26	11	55.8	1.776
4	4	49	37.89	2.2145	26	13	38.5	1.648
5	4	51	50.77	2.2147	26	15	13.5	1.519
6	4	54	3.65	2.2148	26	16	40.8	1.392
7	4	56	16.54	2.2148	26	18	0.5	1.264
8	4	58	29.43	2.2148	26	19	12.5	1.136
9	5	0	42.32	2.2148	26	20	16.8	1.008
10	5	2	55.20	2.2146	26	21	13.4	0.880
11	5	5	8.07	2.2143	26	22	2.4	0.753
12	5	7	20.92	2.2141	26	22	43.7	0.624
13	5	9	33.76	2.2138	26	23	17.3	0.496
14	5	11	46.57	2.2133	26	23	43.2	0.368
15	5	13	59.36	2.2129	26	24	1.5	0.241
16	5	16	12.12	2.2123	26	24	12.1	+0.113
17	5	18	24.84	2.2118	26	24	15.1	−0.014
18	5	20	37.53	2.2112	26	24	10.4	0.142
19	5	22	50.18	2.2104	26	23	58.1	0.269
20	5	25	2.78	2.2096	26	23	38.1	0.397
21	5	27	15.33	2.2088	26	23	10.5	0.523
22	5	29	27.83	2.2078	26	22	35.3	0.651
23	5	31	40.27	2.2068	+26	21	52.4	−0.778
JULY 26.								
0	5	33	52.65	2.2058	+26	21	2.0	−0.903
1	5	36	4.96	2.2047	26	20	4.0	1.030
2	5	38	17.21	2.2036	26	18	58.4	1.157
3	5	40	29.39	2.2024	26	17	45.2	1.283
4	5	42	41.50	2.2011	26	16	24.5	1.408
5	5	44	53.52	2.1997	26	14	56.3	1.533
6	5	47	5.46	2.1983	26	13	20.6	1.658
7	5	49	17.31	2.1968	26	11	37.3	1.783
8	5	51	29.08	2.1953	26	9	46.6	1.908
9	5	53	40.75	2.1938	26	7	48.4	2.032
10	5	55	52.33	2.1921	26	5	42.8	2.156
11	5	58	3.80	2.1903	26	3	29.7	2.280
12	6	0	15.17	2.1886	26	1	9.2	2.403
13	6	2	26.43	2.1868	25	58	41.3	2.527
14	6	4	37.58	2.1849	25	56	6.0	2.649
15	6	6	48.62	2.1830	25	53	23.4	2.771
16	6	8	59.54	2.1809	25	50	33.5	2.893
17	6	11	10.33	2.1788	25	47	36.2	3.015
18	6	13	21.00	2.1768	25	44	31.7	3.136
19	6	15	31.55	2.1748	25	41	19.9	3.258
20	6	17	41.97	2.1725	25	38	0.8	3.378
21	6	19	52.25	2.1702	25	34	34.5	3.498
22	6	22	2.39	2.1679	25	31	1.1	3.617
23	6	24	12.40	2.1656	25	27	20.5	3.736
24	6	26	22.26	2.1632	+25	23	32.8	−3.854

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JULY 27.					JULY 29.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	6 26 22.26	2.1632	+25 23 32.8	−3.854	0	8 6 45.76	2.0118	+20 12 37.0	− 8.8
1	6 28 31.98	2.1608	25 19 38.0	3.973	1	8 8 46.36	2.0083	20 3 43.3	8.9
2	6 30 41.55	2.1583	25 15 36.1	4.090	2	8 10 46.76	2.0049	19 54 44.4	9.0
3	6 32 50.97	2.1557	25 11 27.2	4.208	3	8 12 46.95	2.0015	19 45 40.3	9.1
4	6 35 0.23	2.1530	25 7 11.2	4.325	4	8 14 46.94	1.9982	19 36 31.1	9.1
5	6 37 9.33	2.1504	25 2 48.2	4.441	5	8 16 46.73	1.9948	19 27 16.9	9.2
6	6 39 18.28	2.1478	24 58 18.3	4.556	6	8 18 46.31	1.9913	19 17 57.6	9.3
7	6 41 27.07	2.1451	24 53 41.5	4.671	7	8 20 45.69	1.9880	19 8 33.3	9.4
8	6 43 35.69	2.1423	24 48 57.8	4.786	8	8 22 44.87	1.9846	18 59 4.1	9.5
9	6 45 44.14	2.1395	24 44 7.2	4.900	9	8 24 43.84	1.9813	18 49 30.1	9.6
10	6 47 52.43	2.1367	24 39 9.8	5.013	10	8 26 42.62	1.9780	18 39 51.2	9.6
11	6 50 0.54	2.1338	24 34 5.6	5.126	11	8 28 41.20	1.9747	18 30 7.5	9.7
12	6 52 8.48	2.1308	24 28 54.7	5.238	12	8 30 39.58	1.9713	18 20 19.1	9.8
13	6 54 16.24	2.1279	24 23 37.0	5.351	13	8 32 37.76	1.9681	18 10 26.0	9.9
14	6 56 23.83	2.1250	24 18 12.6	5.462	14	8 34 35.75	1.9649	18 0 28.3	10.0
15	6 58 31.24	2.1219	24 12 41.6	5.573	15	8 36 33.55	1.9617	17 50 25.9	10.0
16	7 0 38.46	2.1188	24 7 3.9	5.683	16	8 38 31.15	1.9585	17 40 18.9	10.1
17	7 2 45.50	2.1158	24 1 19.7	5.792	17	8 40 28.57	1.9553	17 30 7.5	10.2
18	7 4 52.36	2.1128	23 55 28.9	5.901	18	8 42 25.79	1.9522	17 19 51.6	10.3
19	7 6 59.03	2.1096	23 49 31.6	6.009	19	8 44 22.83	1.9491	17 9 31.3	10.3
20	7 9 5.51	2.1064	23 43 27.8	6.117	20	8 46 19.68	1.9459	16 59 6.6	10.4
21	7 11 11.80	2.1033	23 37 17.6	6.223	21	8 48 16.34	1.9428	16 48 37.6	10.5
22	7 13 17.90	2.1000	23 31 1.0	6.329	22	8 50 12.82	1.9398	16 38 4.4	10.5
23	7 15 23.80	2.0968	+23 24 38.1	−6.435	23	8 52 9.12	1.9368	+16 27 26.9	−10.6
	JULY 28.					JULY 30.			
0	7 17 29.51	2.0935	+23 18 8.8	−6.541	0	8 54 5.24	1.9338	+16 16 45.2	−10.7
1	7 19 35.02	2.0902	23 11 33.2	6.645	1	8 56 1.18	1.9308	16 5 59.4	10.7
2	7 21 40.33	2.0869	23 4 51.4	6.748	2	8 57 56.94	1.9279	15 55 9.5	10.8
3	7 23 45.45	2.0837	22 58 3.4	6.851	3	8 59 52.53	1.9251	15 44 15.5	10.8
4	7 25 50.37	2.0803	22 51 9.3	6.953	4	9 1 47.95	1.9223	15 33 17.6	10.9
5	7 27 55.08	2.0769	22 44 9.0	7.056	5	9 3 43.20	1.9194	15 22 15.7	11.0
6	7 29 59.60	2.0736	22 37 2.6	7.157	6	9 5 38.28	1.9166	15 11 9.9	11.1
7	7 32 3.91	2.0702	22 29 50.2	7.257	7	9 7 33.19	1.9138	15 0 0.3	11.1
8	7 34 8.02	2.0668	22 22 31.8	7.357	8	9 9 27.94	1.9111	14 48 46.9	11.2
9	7 36 11.92	2.0633	22 15 7.4	7.455	9	9 11 22.52	1.9084	14 37 29.7	11.3
10	7 38 15.62	2.0600	22 7 37.2	7.553	10	9 13 16.95	1.9058	14 26 8.8	11.3
11	7 40 19.12	2.0566	22 0 1.1	7.651	11	9 15 11.22	1.9032	14 14 44.3	11.4
12	7 42 22.41	2.0531	21 52 19.1	7.748	12	9 17 5.33	1.9006	14 3 16.1	11.5
13	7 44 25.49	2.0497	21 44 31.4	7.843	13	9 18 59.29	1.8981	13 51 44.3	11.5
14	7 46 28.37	2.0463	21 36 37.9	7.939	14	9 20 53.10	1.8956	13 40 9.1	11.6
15	7 48 31.04	2.0428	21 28 38.7	8.033	15	9 22 46.76	1.8932	13 28 30.4	11.6
16	7 50 33.50	2.0393	21 20 33.9	8.128	16	9 24 40.28	1.8908	13 16 48.2	11.7
17	7 52 35.76	2.0359	21 12 23.4	8.221	17	9 26 33.66	1.8884	13 5 2.7	11.7
18	7 54 37.81	2.0324	21 4 7.4	8.313	18	9 28 26.89	1.8861	12 53 13.9	11.8
19	7 56 39.65	2.0290	20 55 45.8	8.405	19	9 30 19.99	1.8838	12 41 21.7	11.8
20	7 58 41.29	2.0256	20 47 18.8	8.495	20	9 32 12.95	1.8816	12 29 26.3	11.9
21	8 0 42.72	2.0221	20 38 46.4	8.585	21	9 34 5.78	1.8793	12 17 27.7	12.0
22	8 2 43.94	2.0186	20 30 8.6	8.675	22	9 35 58.47	1.8772	12 5 26.0	12.0
23	8 4 44.95	2.0152	20 21 25.4	8.763	23	9 37 51.04	1.8752	11 53 21.2	12.
24	8 6 45.76	2.0118	+20 12 37.0	−8.851	24	9 39 43.49	1.8731	+11 41 13.3	−12.

GREENWICH MEAN TIME.

Hour.	Right Ascension.			Var. per Min.	Declination.			Var. per Min.
	JULY 31.							
	h	m	s	s	°	′	″	″
0	9	39	43.49	1.8731	+11	41	13.3	−12.157
1	9	41	35.81	1.8711	11	29	2.4	12.206
2	9	43	28.02	1.8692	11	16	48.6	12.255
3	9	45	20.11	1.8672	11	4	31.8	12.303
4	9	47	12.08	1.8653	10	52	12.2	12.351
5	9	49	3.95	1.8636	10	39	49.7	12.398
6	9	50	55.71	1.8618	10	27	24.5	12.443
7	9	52	47.37	1.8601	10	14	56.6	12.488
8	9	54	38.92	1.8584	10	2	26.0	12.533
9	9	56	30.38	1.8568	9	49	52.7	12.577
10	9	58	21.74	1.8553	9	37	16.8	12.619
11	10	0	13.01	1.8538	9	24	38.4	12.661
12	10	2	4.19	1.8523	9	11	57.5	12.702
13	10	3	55.29	1.8509	8	59	14.2	12.742
14	10	5	46.30	1.8496	8	46	28.5	12.782
15	10	7	37.24	1.8483	8	33	40.4	12.822
16	10	9	28.10	1.8471	8	20	49.9	12.860
17	10	11	18.89	1.8459	8	7	57.2	12.897
18	10	13	9.61	1.8448	7	55	2.3	12.933
19	10	15	0.26	1.8437	7	42	5.3	12.968
20	10	16	50.85	1.8427	7	29	6.1	13.004
21	10	18	41.38	1.8418	7	16	4.8	13.038
22	10	20	31.86	1.8409	7	3	1.5	13.072
23	10	22	22.29	1.8401	+ 6	49	56.2	−13.105
	AUGUST 1.							
0	10	24	12.67	1.8393	+ 6	36	48.9	−13.137
1	10	26	3.01	1.8386	6	23	39.8	13.168
2	10	27	53.30	1.8379	6	10	28.8	13.198
3	10	29	43.56	1.8373	5	57	16.0	13.228
4	10	31	33.78	1.8368	5	44	1.5	13.256
5	10	33	23.97	1.8363	5	30	45.3	13.284
6	10	35	14.14	1.8359	5	17	27.4	13.312
7	10	37	4.28	1.8355	5	4	7.9	13.338
8	10	38	54.40	1.8353	4	50	46.8	13.364
9	10	40	44.51	1.8350	4	37	24.2	13.389
10	10	42	34.60	1.8348	4	24	0.1	13.414
11	10	44	24.69	1.8348	4	10	34.5	13.438
12	10	46	14.77	1.8347	3	57	7.6	13.460
13	10	48	4.85	1.8348	3	43	39.3	13.482
14	10	49	54.94	1.8348	3	30	9.8	13.502
15	10	51	45.03	1.8349	3	16	39.1	13.523
16	10	53	35.13	1.8352	3	3	7.1	13.543
17	10	55	25.25	1.8354	2	49	33.9	13.562
18	10	57	15.38	1.8358	2	35	59.7	13.579
19	10	59	5.54	1.8362	2	22	24.4	13.597
20	11	0	55.72	1.8367	2	8	48.1	13.613
21	11	2	45.94	1.8373	1	55	10.9	13.628
22	11	4	36.19	1.8378	1	41	32.7	13.643
23	11	6	26.48	1.8385	1	27	53.7	13.657
24	11	8	16.81	1.8393	+ 1	14	13.9	−13.670

Hour.	Right Ascension.			Var. per Min.	Declination.			Var. per Min.
	AUGUST 2.							
	h	m	s	s	°	′	″	″
0	11	8	16.81	1.8393	+1	14	13.9	−13.670
1	11	10	7.19	1.8401	1	0	33.3	13.683
2	11	11	57.62	1.8409	0	46	51.9	13.695
3	11	13	48.10	1.8418	0	33	9.9	13.705
4	11	15	38.64	1.8429	0	19	27.3	13.715
5	11	17	29.25	1.8440	+0	5	44.1	13.725
6	11	19	19.92	1.8452	−0	7	59.7	13.733
7	11	21	10.67	1.8464	0	21	43.9	13.741
8	11	23	1.49	1.8477	0	35	28.6	13.748
9	11	24	52.39	1.8491	0	49	13.6	13.753
10	11	26	43.38	1.8505	1	2	59.0	13.758
11	11	28	34.45	1.8520	1	16	44.6	13.763
12	11	30	25.62	1.8536	1	30	30.5	13.767
13	11	32	16.88	1.8552	1	44	16.6	13.769
14	11	34	8.24	1.8569	1	58	2.8	13.771
15	11	35	59.71	1.8587	2	11	49.1	13.772
16	11	37	51.28	1.8605	2	25	35.4	13.772
17	11	39	42.97	1.8625	2	39	21.7	13.771
18	11	41	34.78	1.8645	2	53	7.9	13.769
19	11	43	26.71	1.8666	3	6	54.0	13.768
20	11	45	18.77	1.8688	3	20	40.0	13.764
21	11	47	10.96	1.8709	3	34	25.7	13.760
22	11	49	3.28	1.8732	3	48	11.2	13.755
23	11	50	55.74	1.8756	−4	1	56.3	−13.748
	AUGUST 3.							
0	11	52	48.35	1.8780	−4	15	41.0	−13.742
1	11	54	41.10	1.8805	4	29	25.3	13.734
2	11	56	34.01	1.8832	4	43	9.1	13.726
3	11	58	27.08	1.8858	4	56	52.4	13.717
4	12	0	20.31	1.8886	5	10	35.1	13.706
5	12	2	13.71	1.8913	5	24	17.1	13.694
6	12	4	7.27	1.8942	5	37	58.4	13.683
7	12	6	1.01	1.8972	5	51	39.0	13.669
8	12	7	54.93	1.9003	6	5	18.7	13.655
9	12	9	49.04	1.9033	6	18	57.6	13.640
10	12	11	43.33	1.9065	6	32	35.5	13.624
11	12	13	37.82	1.9098	6	46	12.5	13.608
12	12	15	32.51	1.9132	6	59	48.4	13.589
13	12	17	27.40	1.9165	7	13	23.2	13.570
14	12	19	22.49	1.9200	7	26	56.8	13.551
15	12	21	17.80	1.9236	7	40	29.3	13.531
16	12	23	13.32	1.9272	7	54	0.5	13.508
17	12	25	9.06	1.9309	8	7	30.3	13.486
18	12	27	5.03	1.9347	8	20	58.8	13.463
19	12	29	1.22	1.9385	8	34	25.9	13.438
20	12	30	57.65	1.9425	8	47	51.4	13.412
21	12	32	54.32	1.9465	9	1	15.3	13.385
22	12	34	51.23	1.9506	9	14	37.6	13.358
23	12	36	48.39	1.9548	9	27	58.3	13.330
24	12	38	45.80	1.9590	−9	41	17.2	−13.300

MOON, 1916.

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.
	AUGUST 4.					AUGUST 6.		
	h m s	s	° ′ ″	″		h m s	s	° ′ ″
0	12 38 45.80	1.9590	− 9 41 17.2	−13.300	0	14 19 2.29	2.2438	−19 23 29.0
1	12 40 43.47	1.9633	9 54 34.3	13.269	1	14 21 17.14	2.2511	19 33 54.3
2	12 42 41.40	1.9677	10 7 49.5	13.237	2	14 23 32.42	2.2584	19 44 14.0
3	12 44 39.59	1.9721	10 21 2.7	13.203	3	14 25 48.15	2.2658	19 54 28.0
4	12 46 38.05	1.9767	10 34 13.9	13.170	4	14 28 4.32	2.2733	20 4 36.3
5	12 48 36.79	1.9813	10 47 23.1	13.136	5	14 30 20.94	2.2807	20 14 38.7
6	12 50 35.81	1.9860	11 0 30.2	13.099	6	14 32 38.00	2.2882	20 24 35.1
7	12 52 35.11	1.9908	11 13 35.0	13.062	7	14 34 55.52	2.2957	20 34 25.5
8	12 54 34.70	1.9957	11 26 37.6	13.024	8	14 37 13.48	2.3031	20 44 9.7
9	12 56 34.59	2.0006	11 39 37.9	12.985	9	14 39 31.89	2.3107	20 53 47.7
10	12 58 34.77	2.0055	11 52 35.8	12.944	10	14 41 50.76	2.3183	21 3 19.4
11	13 0 35.25	2.0106	12 5 31.2	12.902	11	14 44 10.08	2.3258	21 12 44.6
12	13 2 36.04	2.0158	12 18 24.0	12.858	12	14 46 29.86	2.3334	21 22 3.3
13	13 4 37.14	2.0209	12 31 14.2	12.815	13	14 48 50.09	2.3410	21 31 15.4
14	13 6 38.55	2.0262	12 44 1.8	12.770	14	14 51 10.78	2.3486	21 40 20.7
15	13 8 40.28	2.0315	12 56 46.6	12.723	15	14 53 31.92	2.3562	21 49 19.3
16	13 10 42.33	2.0369	13 9 28.6	12.676	16	14 55 53.52	2.3638	21 58 11.0
17	13 12 44.71	2.0424	13 22 7.7	12.627	17	14 58 15.58	2.3714	22 6 55.7
18	13 14 47.42	2.0480	13 34 43.8	12.577	18	15 0 38.09	2.3790	22 15 33.2
19	13 16 50.47	2.0537	13 47 16.9	12.526	19	15 3 1.06	2.3866	22 24 3.5
20	13 18 53.86	2.0593	13 59 46.9	12.473	20	15 5 24.48	2.3942	22 32 26.6
21	13 20 57.59	2.0651	14 12 13.7	12.420	21	15 7 48.36	2.4018	22 40 42.3
22	13 23 1.67	2.0709	14 24 37.3	12.365	22	15 10 12.70	2.4094	22 48 50.5
23	13 25 6.10	2.0768	−14 36 57.5	−12.309	23	15 12 37.49	2.4169	−22 56 51.1
	AUGUST 5.					AUGUST 7.		
0	13 27 10.89	2.0828	−14 49 14.4	−12.252	0	15 15 2.73	2.4245	−23 4 44.0
1	13 29 16.04	2.0888	15 1 27.7	12.193	1	15 17 28.43	2.4320	23 12 29.1
2	13 31 21.55	2.0949	15 13 37.5	12.133	2	15 19 54.57	2.4394	23 20 6.4
3	13 33 27.43	2.1011	15 25 43.7	12.072	3	15 22 21.16	2.4469	23 27 35.7
4	13 35 33.68	2.1073	15 37 46.1	12.008	4	15 24 48.20	2.4543	23 34 57.0
5	13 37 40.31	2.1137	15 49 44.7	11.945	5	15 27 15.68	2.4617	23 42 10.0
6	13 39 47.32	2.1200	16 1 39.5	11.880	6	15 29 43.60	2.4690	23 49 14.8
7	13 41 54.71	2.1264	16 13 30.3	11.813	7	15 32 11.96	2.4763	23 56 11.3
8	13 44 2.49	2.1329	16 25 17.1	11.746	8	15 34 40.76	2.4837	24 2 59.3
9	13 46 10.66	2.1395	16 36 59.8	11.677	9	15 37 10.00	2.4909	24 9 38.8
10	13 48 19.23	2.1461	16 48 38.3	11.606	10	15 39 39.67	2.4980	24 16 9.7
11	13 50 28.19	2.1527	17 0 12.5	11.533	11	15 42 9.76	2.5051	24 22 31.8
12	13 52 37.55	2.1594	17 11 42.3	11.460	12	15 44 40.28	2.5122	24 28 45.1
13	13 54 47.32	2.1662	17 23 7.7	11.385	13	15 47 11.22	2.5192	24 34 49.5
14	13 56 57.49	2.1729	17 34 28.5	11.309	14	15 49 42.58	2.5261	24 40 44.9
15	13 59 8.07	2.1798	17 45 44.8	11.232	15	15 52 14.35	2.5329	24 46 31.1
16	14 1 19.07	2.1868	17 56 56.3	11.153	16	15 54 46.53	2.5397	24 52 8.2
17	14 3 30.48	2.1937	18 8 3.1	11.073	17	15 57 19.11	2.5464	24 57 36.0
18	14 5 42.31	2.2008	18 19 5.0	10.990	18	15 59 52.10	2.5531	25 2 54.5
19	14 7 54.57	2.2078	18 30 1.9	10.907	19	16 2 25.48	2.5596	25 8 3.5
20	14 10 7.25	2.2149	18 40 53.8	10.822	20	16 4 59.25	2.5660	25 13 3.0
21	14 12 20.36	2.2222	18 51 40.5	10.735	21	16 7 33.40	2.5723	25 17 52.8
22	14 14 33.91	2.2293	19 2 22.0	10.648	22	16 10 7.93	2.5787	25 22 32.9
23	14 16 47.88	2.2365	19 12 58.2	10.558	23	16 12 42.84	2.5848	25 27 3.3
24	14 19 2.29	2.2438	−19 23 29.0	−10.468	24	16 15 18.11	2.5908	−25 31 23.8

our.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	AUGUST 8.					AUGUST 10.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	16 15 18.11	2.5908	−25 31 23.8	−4.258	0	18 24 5.12	2.7138	−25 26 38.0	+ 4.661
1	16 17 53.74	2.5968	25 35 34.3	4.092	1	18 26 47.90	2.7123	25 21 52.6	4.852
2	16 20 29.73	2.6028	25 39 34.8	3.924	2	18 29 30.59	2.7107	25 16 55.8	5.041
3	16 23 6.07	2.6085	25 43 25.2	3.755	3	18 32 13.18	2.7088	25 11 47.7	5.230
4	16 25 42.75	2.6142	25 47 5.4	3.584	4	18 34 55.65	2.7068	25 6 28.2	5.418
5	16 28 19.77	2.6197	25 50 35.3	3.412	5	18 37 38.00	2.7047	25 0 57.5	5.606
6	16 30 57.11	2.6250	25 53 54.8	3.239	6	18 40 20.21	2.7023	24 55 15.5	5.793
7	16 33 34.77	2.6303	25 57 4.0	3.066	7	18 43 2.28	2.6999	24 49 22.3	5.979
8	16 36 12.75	2.6355	26 0 2.7	2.890	8	18 45 44.20	2.6973	24 43 18.0	6.164
9	16 38 51.03	2.6406	26 2 50.8	2.713	9	18 48 25.96	2.6946	24 37 2.6	6.348
10	16 41 29.61	2.6454	26 5 28.3	2.536	10	18 51 7.55	2.6917	24 30 36.2	6.532
11	16 44 8.48	2.6502	26 7 55.1	2.358	11	18 53 48.96	2.6887	24 23 58.8	6.714
12	16 46 47.63	2.6548	26 10 11.2	2.178	12	18 56 30.19	2.6855	24 17 10.5	6.896
13	16 49 27.05	2.6593	26 12 16.5	1.998	13	18 59 11.22	2.6822	24 10 11.3	7.077
14	16 52 6.74	2.6637	26 14 10.9	1.815	14	19 1 52.05	2.6787	24 3 1.3	7.256
15	16 54 46.69	2.6678	26 15 54.3	1.633	15	19 4 32.66	2.6751	23 55 40.6	7.434
16	16 57 26.88	2.6718	26 17 26.8	1.450	16	19 7 13.06	2.6714	23 48 9.2	7.611
17	17 0 7.31	2.6758	26 18 48.3	1.265	17	19 9 53.23	2.6676	23 40 27.3	7.787
18	17 2 47.97	2.6795	26 19 58.6	1.079	18	19 12 33.17	2.6636	23 32 34.8	7.962
19	17 5 28.85	2.6831	26 20 57.8	0.894	19	19 15 12.86	2.6595	23 24 31.9	8.135
20	17 8 9.94	2.6865	26 21 45.9	0.708	20	19 17 52.31	2.6554	23 16 18.6	8.307
21	17 10 51.23	2.6898	26 22 22.7	0.519	21	19 20 31.51	2.6511	23 7 55.1	8.477
22	17 13 32.71	2.6928	26 22 48.2	0.331	22	19 23 10.44	2.6467	22 59 21.4	8.647
23	17 16 14.37	2.6958	−26 23 2.4	−0.143	23	19 25 49.11	2.6422	−22 50 37.5	+ 8.815
	AUGUST 9.					AUGUST 11.			
0	17 18 56.21	2.6987	−26 23 5.3	+0.047	0	19 28 27.50	2.6375	−22 41 43.6	+ 8.981
1	17 21 38.21	2.7013	26 22 56.8	0.237	1	19 31 5.61	2.6328	22 32 39.8	9.146
2	17 24 20.36	2.7037	26 22 36.9	0.428	2	19 33 43.43	2.6279	22 23 26.1	9.309
3	17 27 2.65	2.7059	26 22 5.5	0.619	3	19 36 20.96	2.6230	22 14 2.7	9.471
4	17 29 45.07	2.7080	26 21 22.6	0.810	4	19 38 58.19	2.6180	22 4 29.6	9.632
5	17 32 27.61	2.7099	26 20 28.3	1.001	5	19 41 35.12	2.6129	21 54 46.9	9.790
6	17 35 10.26	2.7117	26 19 22.5	1.193	6	19 44 11.74	2.6078	21 44 54.8	9.947
7	17 37 53.01	2.7133	26 18 5.1	1.387	7	19 46 48.05	2.6025	21 34 53.3	10.102
8	17 40 35.86	2.7148	26 16 36.1	1.579	8	19 49 24.04	2.5972	21 24 42.6	10.255
9	17 43 18.78	2.7159	26 14 55.6	1.772	9	19 51 59.71	2.5918	21 14 22.7	10.408
10	17 46 1.77	2.7171	26 13 3.5	1.965	10	19 54 35.06	2.5864	21 3 53.7	10.558
11	17 48 44.83	2.7180	26 10 59.8	2.158	11	19 57 10.08	2.5808	20 53 15.7	10.707
12	17 51 27.93	2.7187	26 8 44.6	2.351	12	19 59 44.76	2.5753	20 42 28.9	10.853
13	17 54 11.07	2.7193	26 6 17.7	2.545	13	20 2 19.11	2.5696	20 31 33.4	10.997
14	17 56 54.24	2.7196	26 3 39.2	2.738	14	20 4 53.11	2.5638	20 20 29.3	11.140
15	17 59 37.42	2.7198	26 0 49.1	2.932	15	20 7 26.77	2.5581	20 9 16.6	11.282
16	18 2 20.61	2.7198	25 57 47.4	3.125	16	20 10 0.08	2.5523	19 57 55.5	11.420
17	18 5 3.79	2.7196	25 54 34.1	3.318	17	20 12 33.05	2.5465	19 46 26.2	11.557
18	18 7 46.96	2.7193	25 51 9.3	3.510	18	20 15 5.66	2.5406	19 34 48.7	11.693
19	18 10 30.11	2.7188	25 47 32.9	3.703	19	20 17 37.92	2.5347	19 23 3.1	11.826
20	18 13 13.22	2.7182	25 43 44.9	3.896	20	20 20 9.82	2.5287	19 11 9.6	11.958
21	18 15 56.29	2.7173	25 39 45.4	4.088	21	20 22 41.36	2.5228	18 59 8.2	12.088
22	18 18 39.30	2.7163	25 35 34.4	4.279	22	20 25 12.55	2.5168	18 46 59.1	12.214
23	18 21 22.25	2.7152	25 31 11.9	4.470	23	20 27 43.37	2.5107	18 34 42.5	12.339
24	18 24 5.12	2.7138	−25 26 38.0	+4.661	24	20 30 13.83	2.5047	−18 22 18.4	+12.463

MOON, 1916.

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	AUGUST 12.					AUGUST 14.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	20 30 13.83	2.5047	−18 22 18.4	+12.463	0	22 23 41.96	2.2377	−6 41 21.4	+15.947
1	20 32 43.93	2.4986	18 9 46.9	12.585	1	22 25 56.09	2.2333	6 25 23.9	15.969
2	20 35 13.66	2.4925	17 57 8.2	12.704	2	22 28 9.96	2.2290	6 9 25.1	15.990
3	20 37 43.03	2.4864	17 44 22.4	12.822	3	22 30 23.57	2.2248	5 53 25.1	16.010
4	20 40 12.03	2.4803	17 31 29.6	12.937	4	22 32 36.93	2.2207	5 37 23.9	16.028
5	20 42 40.66	2.4741	17 18 30.0	13.049	5	22 34 50.05	2.2167	5 21 21.8	16.043
6	20 45 8.92	2.4680	17 5 23.7	13.161	6	22 37 2.93	2.2127	5 5 18.8	16.057
7	20 47 36.82	2.4619	16 52 10.7	13.271	7	22 39 15.57	2.2088	4 49 15.0	16.068
8	20 50 4.35	2.4558	16 38 51.2	13.378	8	22 41 27.98	2.2049	4 33 10.6	16.078
9	20 52 31.51	2.4497	16 25 25.4	13.483	9	22 43 40.16	2.2011	4 17 5.6	16.087
10	20 54 58.31	2.4436	16 11 53.3	13.586	10	22 45 52.11	2.1973	4 1 0.2	16.093
11	20 57 24.74	2.4374	15 58 15.1	13.686	11	22 48 3.84	2.1938	3 44 54.4	16.098
12	20 59 50.80	2.4313	15 44 31.0	13.784	12	22 50 15.36	2.1903	3 28 48.4	16.101
13	21 2 16.50	2.4253	15 30 41.0	13.881	13	22 52 26.67	2.1868	3 12 42.3	16.102
14	21 4 41.83	2.4192	15 16 45.3	13.975	14	22 54 37.77	2.1833	2 56 36.2	16.102
15	21 7 6.80	2.4132	15 2 44.0	14.068	15	22 56 48.67	2.1800	2 40 30.1	16.100
16	21 9 31.41	2.4073	14 48 37.2	14.158	16	22 58 59.37	2.1768	2 24 24.2	16.096
17	21 11 55.67	2.4013	14 34 25.0	14.247	17	23 1 9.88	2.1736	2 8 18.6	16.091
18	21 14 19.56	2.3953	14 20 7.6	14.332	18	23 3 20.20	2.1705	1 52 13.3	16.084
19	21 16 43.10	2.3893	14 5 45.2	14.415	19	23 5 30.34	2.1674	1 36 8.5	16.075
20	21 19 6.28	2.3834	13 51 17.8	14.498	20	23 7 40.29	2.1644	1 20 4.3	16.064
21	21 21 29.11	2.3776	13 36 45.5	14.578	21	23 9 50.07	2.1616	1 4 0.8	16.053
22	21 23 51.59	2.3718	13 22 8.5	14.655	22	23 11 59.68	2.1588	0 47 58.0	16.039
23	21 26 13.72	2.3659	−13 7 26.9	+14.730	23	23 14 9.12	2.1560	−0 31 56.1	+16.023
	AUGUST 13.					AUGUST 15.			
0	21 28 35.50	2.3602	−12 52 40.9	+14.803	0	23 16 18.40	2.1533	−0 15 55.2	+16.006
1	21 30 56.94	2.3545	12 37 50.6	14.874	1	23 18 27.52	2.1508	+0 0 4.6	15.986
2	21 33 18.04	2.3488	12 22 56.0	14.944	2	23 20 36.49	2.1483	0 16 3.3	15.966
3	21 35 38.80	2.3432	12 7 57.3	15.011	3	23 22 45.31	2.1458	0 32 0.8	15.947
4	21 37 59.22	2.3376	11 52 54.7	15.075	4	23 24 53.99	2.1434	0 47 56.9	15.923
5	21 40 19.31	2.3321	11 37 48.3	15.138	5	23 27 2.52	2.1411	1 3 51.5	15.898
6	21 42 39.07	2.3266	11 22 38.1	15.199	6	23 29 10.92	2.1389	1 19 44.7	15.873
7	21 44 58.50	2.3212	11 7 24.4	15.258	7	23 31 19.19	2.1368	1 35 36.3	15.845
8	21 47 17.61	2.3158	10 52 7.2	15.314	8	23 33 27.33	2.1347	1 51 26.1	15.816
9	21 49 36.39	2.3104	10 36 46.7	15.368	9	23 35 35.35	2.1327	2 7 14.2	15.786
10	21 51 54.86	2.3052	10 21 23.0	15.421	10	23 37 43.25	2.1308	2 23 0.4	15.754
11	21 54 13.01	2.2999	10 5 56.2	15.472	11	23 39 51.04	2.1289	2 38 44.7	15.722
12	21 56 30.85	2.2948	9 50 26.4	15.520	12	23 41 58.72	2.1271	2 54 27.0	15.687
13	21 58 48.38	2.2897	9 34 53.8	15.567	13	23 44 6.29	2.1253	3 10 7.1	15.650
14	22 1 5.61	2.2847	9 19 18.4	15.611	14	23 46 13.76	2.1238	3 25 45.0	15.613
15	22 3 22.54	2.2797	9 3 40.5	15.653	15	23 48 21.14	2.1222	3 41 20.6	15.573
16	22 5 39.17	2.2748	8 48 0.1	15.693	16	23 50 28.42	2.1207	3 56 53.8	15.533
17	22 7 55.51	2.2698	8 32 17.3	15.732	17	23 52 35.62	2.1193	4 12 24.6	15.492
18	22 10 11.55	2.2650	8 16 32.2	15.768	18	23 54 42.73	2.1178	4 27 52.9	15.449
19	22 12 27.31	2.2603	8 0 45.1	15.803	19	23 56 49.76	2.1165	4 43 18.5	15.405
20	22 14 42.79	2.2557	7 44 55.9	15.836	20	23 58 56.71	2.1153	4 58 41.5	15.360
21	22 16 57.99	2.2511	7 29 4.8	15.866	21	0 1 3.59	2.1141	5 14 1.7	15.312
22	22 19 12.92	2.2465	7 13 12.0	15.894	22	0 3 10.40	2.1130	5 29 19.1	15.265
23	22 21 27.57	2.2420	6 57 17.5	15.922	23	0 5 17.15	2.1120	5 44 33.5	15.215
24	22 23 41.96	2.2377	− 6 41 21.4	+15.947	24	0 7 23.84	2.1111	+5 59 44.9	+15.165

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	AUGUST 16.					**AUGUST 18.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	0 7 23.84	2.1111	+ 5 59 44.9	+15.165	0	1 48 44.00	2.1302	+16 48 28.3	+11.493
1	0 9 30.48	2.1102	6 14 53.3	15.113	1	1 50 51.85	2.1316	16 59 54.9	11.394
2	0 11 37.06	2.1093	6 29 58.5	15.060	2	1 52 59.79	2.1331	17 11 15.6	11.295
3	0 13 43.59	2.1085	6 45 0.5	15.006	3	1 55 7.82	2.1345	17 22 30.3	11.195
4	0 15 50.08	2.1078	6 59 59.2	14.951	4	1 57 15.93	2.1360	17 33 39.0	11.095
5	0 17 56.53	2.1073	7 14 54.6	14.894	5	1 59 24.14	2.1376	17 44 41.7	10.994
6	0 20 2.95	2.1067	7 29 46.5	14.836	6	2 1 32.44	2.1391	17 55 38.3	10.892
7	0 22 9.33	2.1062	7 44 34.9	14.777	7	2 3 40.83	2.1406	18 6 28.7	10.789
8	0 24 15.69	2.1058	7 59 19.7	14.717	8	2 5 49.31	2.1422	18 17 13.0	10.686
9	0 26 22.02	2.1053	8 14 0.9	14.656	9	2 7 57.89	2.1438	18 27 51.0	10.582
10	0 28 28.33	2.1050	8 28 38.4	14.593	10	2 10 6.56	2.1453	18 38 22.8	10.478
11	0 30 34.62	2.1047	8 43 12.1	14.530	11	2 12 15.33	2.1470	18 48 48.3	10.372
12	0 32 40.89	2.1045	8 57 42.0	14.466	12	2 14 24.20	2.1487	18 59 7.4	10.266
13	0 34 47.16	2.1044	9 12 8.0	14.400	13	2 16 33.17	2.1503	19 9 20.2	10.160
14	0 36 53.42	2.1043	9 26 30.0	14.333	14	2 18 42.23	2.1519	19 19 26.6	10.053
15	0 38 59.67	2.1042	9 40 47.9	14.264	15	2 20 51.40	2.1537	19 29 26.5	9.944
16	0 41 5.92	2.1043	9 55 1.7	14.196	16	2 23 0.67	2.1553	19 39 19.9	9.836
17	0 43 12.18	2.1043	10 9 11.4	14.126	17	2 25 10.04	2.1570	19 49 6.8	9.727
18	0 45 18.44	2.1045	10 23 16.8	14.055	18	2 27 19.51	2.1587	19 58 47.1	9.618
19	0 47 24.72	2.1048	10 37 18.0	13.983	19	2 29 29.08	2.1603	20 8 20.9	9.508
20	0 49 31.01	2.1049	10 51 14.8	13.909	20	2 31 38.75	2.1621	20 17 48.0	9.396
21	0 51 37.31	2.1052	11 5 7.1	13.835	21	2 33 48.53	2.1638	20 27 8.4	9.284
22	0 53 43.63	2.1056	11 18 55.0	13.761	22	2 35 58.41	2.1655	20 36 22.1	9.173
23	0 55 49.98	2.1060	+11 32 38.4	+13.685	23	2 38 8.39	2.1673	+20 45 29.1	+ 9.060
	AUGUST 17.					**AUGUST 19.**			
0	0 57 56.35	2.1064	+11 46 17.2	+13.608	0	2 40 18.48	2.1690	+20 54 29.3	+ 8.947
1	1 0 2.75	2.1069	11 59 51.3	13.530	1	2 42 28.67	2.1707	21 3 22.7	8.833
2	1 2 9.18	2.1075	12 13 20.8	13.452	2	2 44 38.96	2.1723	21 12 9.3	8.719
3	1 4 15.65	2.1081	12 26 45.5	13.371	3	2 46 49.35	2.1740	21 20 49.0	8.604
4	1 6 22.15	2.1087	12 40 5.3	13.290	4	2 48 59.84	2.1758	21 29 21.8	8.489
5	1 8 28.69	2.1094	12 53 20.3	13.208	5	2 51 10.44	2.1774	21 37 47.7	8.373
6	1 10 35.28	2.1102	13 6 30.3	13.126	6	2 53 21.13	2.1791	21 46 6.6	8.257
7	1 12 41.91	2.1109	13 19 35.4	13.043	7	2 55 31.93	2.1808	21 54 18.5	8.140
8	1 14 48.59	2.1118	13 32 35.4	12.958	8	2 57 42.83	2.1824	22 2 23.4	8.023
9	1 16 55.32	2.1127	13 45 30.3	12.873	9	2 59 53.82	2.1840	22 10 21.2	7.904
10	1 19 2.11	2.1136	13 58 20.1	12.787	10	3 2 4.91	2.1858	22 18 11.9	7.787
11	1 21 8.95	2.1145	14 11 4.7	12.699	11	3 4 16.11	2.1874	22 25 55.6	7.668
12	1 23 15.85	2.1155	14 23 44.0	12.611	12	3 6 27.40	2.1890	22 33 32.1	7.548
13	1 25 22.81	2.1165	14 36 18.0	12.523	13	3 8 38.79	2.1906	22 41 1.4	7.429
14	1 27 29.83	2.1176	14 48 46.7	12.433	14	3 10 50.27	2.1921	22 48 23.6	7.309
15	1 29 36.92	2.1187	15 1 10.0	12.343	15	3 13 1.84	2.1937	22 55 38.5	7.188
16	1 31 44.07	2.1198	15 13 27.8	12.251	16	3 15 13.51	2.1953	23 2 46.2	7.068
17	1 33 51.30	2.1211	15 25 40.1	12.159	17	3 17 25.27	2.1968	23 9 46.7	6.947
18	1 35 58.60	2.1223	15 37 46.9	12.067	18	3 19 37.12	2.1983	23 16 39.8	6.824
19	1 38 5.97	2.1235	15 49 48.1	11.973	19	3 21 49.06	2.1997	23 23 25.6	6.703
20	1 40 13.42	2.1248	16 1 43.6	11.878	20	3 24 1.08	2.2011	23 30 4.1	6.580
21	1 42 20.95	2.1261	16 13 33.4	11.783	21	3 26 13.19	2.2026	23 36 35.2	6.457
22	1 44 28.55	2.1273	16 25 17.5	11.687	22	3 28 25.39	2.2040	23 42 58.9	6.334
23	1 46 36.23	2.1288	16 36 55.8	11.590	23	3 30 37.67	2.2053	23 49 15.3	6.211
24	1 48 44.00	2.1302	+16 48 28.3	+11.493	24	3 32 50.02	2.2066	+23 55 24.2	+ 6.087

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AUGUST 20.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	h m s	s	° ′ ″	″
0	3 32 50.02	2.2066	+23 55 24.2	+6.087
1	3 35 2.46	2.2079	24 1 25.7	5.963
2	3 37 14.97	2.2092	24 7 19.7	5.838
3	3 39 27.56	2.2104	24 13 6.2	5.713
4	3 41 40.22	2.2116	24 18 45.2	5.588
5	3 43 52.95	2.2128	24 24 16.7	5.463
6	3 46 5.76	2.2140	24 29 40.7	5.337
7	3 48 18.63	2.2150	24 34 57.1	5.210
8	3 50 31.56	2.2160	24 40 5.9	5.084
9	3 52 44.55	2.2171	24 45 7.2	4.958
10	3 54 57.61	2.2181	24 50 0.8	4.831
11	3 57 10.72	2.2190	24 54 46.9	4.704
12	3 59 23.89	2.2199	24 59 25.3	4.577
13	4 1 37.11	2.2208	25 3 56.1	4.449
14	4 3 50.38	2.2216	25 8 19.2	4.321
15	4 6 3.70	2.2223	25 12 34.6	4.193
16	4 8 17.06	2.2231	25 16 42.4	4.066
17	4 10 30.47	2.2238	25 20 42.5	3.938
18	4 12 43.91	2.2243	25 24 34.9	3.809
19	4 14 57.39	2.2249	25 28 19.6	3.681
20	4 17 10.90	2.2254	25 31 56.6	3.552
21	4 19 24.44	2.2259	25 35 25.8	3.423
22	4 21 38.01	2.2263	25 38 47.3	3.294
23	4 23 51.60	2.2268	+25 42 1.1	+3.165

AUGUST 21.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
0	4 26 5.22	2.2272	+25 45 7.1	+3.036
1	4 28 18.86	2.2274	25 48 5.4	2.907
2	4 30 32.51	2.2276	25 50 55.9	2.778
3	4 32 46.17	2.2278	25 53 38.7	2.648
4	4 34 59.84	2.2279	25 56 13.7	2.519
5	4 37 13.52	2.2280	25 58 41.0	2.390
6	4 39 27.20	2.2280	26 1 0.5	2.260
7	4 41 40.88	2.2279	26 3 12.2	2.130
8	4 43 54.55	2.2278	26 5 16.1	2.000
9	4 46 8.22	2.2277	26 7 12.2	1.871
10	4 48 21.87	2.2274	26 9 0.6	1.742
11	4 50 35.51	2.2273	26 10 41.2	1.613
12	4 52 49.14	2.2270	26 12 14.1	1.483
13	4 55 2.75	2.2266	26 13 39.2	1.353
14	4 57 16.33	2.2262	26 14 56.5	1.224
15	4 59 29.89	2.2257	26 16 6.1	1.095
16	5 1 43.41	2.2251	26 17 7.9	0.966
17	5 3 56.90	2.2245	26 18 2.0	0.838
18	5 6 10.35	2.2238	26 18 48.4	0.708
19	5 8 23.76	2.2232	26 19 27.0	0.579
20	5 10 37.13	2.2224	26 19 57.9	0.451
21	5 12 50.45	2.2215	26 20 21.1	0.322
22	5 15 3.71	2.2206	26 20 36.5	0.193
23	5 17 16.92	2.2198	26 20 44.3	+0.066
24	5 19 30.08	2.2188	+26 20 44.4	−0.063

AUGUST 22.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	h m s	s	° ′ ″	″
0	5 19 30.08	2.2188	+26 20 44.4	−0.063
1	5 21 43.17	2.2177	26 20 36.8	0.191
2	5 23 56.20	2.2166	26 20 21.5	0.318
3	5 26 9.16	2.2154	26 19 58.6	0.446
4	5 28 22.05	2.2142	26 19 28.0	0.573
5	5 30 34.86	2.2129	26 18 49.8	0.701
6	5 32 47.60	2.2116	26 18 3.9	0.828
7	5 35 0.25	2.2102	26 17 10.4	0.954
8	5 37 12.82	2.2088	26 16 9.4	1.080
9	5 39 25.30	2.2073	26 15 0.8	1.207
10	5 41 37.69	2.2057	26 13 44.6	1.333
11	5 43 49.98	2.2040	26 12 20.9	1.458
12	5 46 2.17	2.2024	26 10 49.6	1.584
13	5 48 14.27	2.2008	26 9 10.8	1.708
14	5 50 26.26	2.1989	26 7 24.6	1.833
15	5 52 38.14	2.1971	26 5 30.9	1.957
16	5 54 49.91	2.1953	26 3 29.8	2.081
17	5 57 1.57	2.1934	26 1 21.2	2.205
18	5 59 13.12	2.1914	25 59 5.2	2.328
19	6 1 24.54	2.1893	25 56 41.8	2.451
20	6 3 35.84	2.1873	25 54 11.1	2.573
21	6 5 47.01	2.1852	25 51 33.0	2.696
22	6 7 58.06	2.1831	25 48 47.6	2.818
23	6 10 8.98	2.1808	+25 45 54.9	−2.938

AUGUST 23.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
0	6 12 19.76	2.1785	+25 42 55.0	−3.059
1	6 14 30.40	2.1763	25 39 47.8	3.180
2	6 16 40.91	2.1740	25 36 33.4	3.300
3	6 18 51.28	2.1716	25 33 11.8	3.420
4	6 21 1.50	2.1691	25 29 43.0	3.539
5	6 23 11.57	2.1666	25 26 7.1	3.658
6	6 25 21.49	2.1641	25 22 24.1	3.776
7	6 27 31.26	2.1616	25 18 34.0	3.894
8	6 29 40.88	2.1590	25 14 36.8	4.012
9	6 31 50.34	2.1564	25 10 32.6	4.128
10	6 33 59.65	2.1538	25 6 21.4	4.244
11	6 36 8.79	2.1510	25 2 3.3	4.360
12	6 38 17.77	2.1483	24 57 38.2	4.476
13	6 40 26.58	2.1455	24 53 6.2	4.591
14	6 42 35.23	2.1428	24 48 27.3	4.705
15	6 44 43.71	2.1399	24 43 41.6	4.818
16	6 46 52.02	2.1371	24 38 49.1	4.932
17	6 49 0.16	2.1342	24 33 49.8	5.045
18	6 51 8.12	2.1312	24 28 43.7	5.158
19	6 53 15.90	2.1283	24 23 30.9	5.268
20	6 55 23.51	2.1253	24 18 11.5	5.379
21	6 57 30.94	2.1223	24 12 45.4	5.490
22	6 59 38.18	2.1193	24 7 12.7	5.599
23	7 1 45.25	2.1163	24 1 33.5	5.708
24	7 3 52.13	2.1132	+23 55 47.7	−5.816

GREENWICH MEAN TIME.

Hour.	Right Ascension.			Var. per Min.	Declination.			Var. per Min.
AUGUST 24.								
	h	m	s	s	°	′	″	″
0	7	3	52.13	2.1132	+23	55	47.7	– 5.818
1	7	5	58.83	2.1101	23	49	55.4	5.926
2	7	8	5.34	2.1069	23	43	56.6	6.033
3	7	10	11.66	2.1038	23	37	51.4	6.140
4	7	12	17.79	2.1007	23	31	39.8	6.247
5	7	14	23.74	2.0975	23	25	21.8	6.353
6	7	16	29.49	2.0943	23	18	57.5	6.458
7	7	18	35.05	2.0911	23	12	26.9	6.563
8	7	20	40.42	2.0878	23	5	50.0	6.666
9	7	22	45.59	2.0846	22	59	7.0	6.768
10	7	24	50.57	2.0814	22	52	17.8	6.871
11	7	26	55.36	2.0782	22	45	22.5	6.973
12	7	28	59.95	2.0748	22	38	21.0	7.075
13	7	31	4.34	2.0716	22	31	13.5	7.175
14	7	33	8.54	2.0683	22	24	0.0	7.275
15	7	35	12.54	2.0651	22	16	40.5	7.374
16	7	37	16.35	2.0618	22	9	15.1	7.473
17	7	39	19.95	2.0583	22	1	43.8	7.571
18	7	41	23.35	2.0551	21	54	6.6	7.668
19	7	43	26.56	2.0518	21	46	23.6	7.764
20	7	45	29.57	2.0485	21	38	34.9	7.860
21	7	47	32.38	2.0453	21	30	40.4	7.956
22	7	49	35.00	2.0419	21	22	40.2	8.051
23	7	51	37.41	2.0386	+21	14	34.3	– 8.144
AUGUST 25.								
0	7	53	39.63	2.0353	+21	6	22.9	– 8.237
1	7	55	41.65	2.0320	20	58	5.9	8.329
2	7	57	43.47	2.0288	20	49	43.4	8.421
3	7	59	45.10	2.0255	20	41	15.4	8.513
4	8	1	46.53	2.0222	20	32	41.9	8.603
5	8	3	47.76	2.0189	20	24	3.0	8.693
6	8	5	48.80	2.0157	20	15	18.8	8.781
7	8	7	49.64	2.0124	20	6	29.3	8.869
8	8	9	50.29	2.0092	19	57	34.5	8.957
9	8	11	50.74	2.0059	19	48	34.5	9.043
10	8	13	51.00	2.0028	19	39	29.3	9.130
11	8	15	51.07	1.9996	19	30	18.9	9.215
12	8	17	50.95	1.9964	19	21	3.5	9.299
13	8	19	50.64	1.9933	19	11	43.0	9.383
14	8	21	50.14	1.9901	19	2	17.5	9.466
15	8	23	49.45	1.9869	18	52	47.1	9.548
16	8	25	48.57	1.9838	18	43	11.7	9.631
17	8	27	47.50	1.9807	18	33	31.4	9.712
18	8	29	46.25	1.9777	18	23	46.3	9.791
19	8	31	44.82	1.9746	18	13	56.5	9.870
20	8	33	43.20	1.9715	18	4	1.9	9.949
21	8	35	41.40	1.9685	17	54	2.6	10.028
22	8	37	39.42	1.9655	17	43	58.6	10.104
23	8	39	37.26	1.9626	17	33	50.1	10.180
24	8	41	34.93	1.9597	+17	23	37.0	–10.256

Hour.	Right Ascension.			Var. per Min.	Declination.			Var. per Min.
AUGUST 26.								
	h	m	s	s	°	′	″	″
0	8	41	34.93	1.9597	+17	23	37.0	–10.256
1	8	43	32.42	1.9568	17	13	19.4	10.331
2	8	45	29.74	1.9538	17	2	57.3	10.406
3	8	47	26.88	1.9509	16	52	30.7	10.479
4	8	49	23.85	1.9481	16	41	59.8	10.552
5	8	51	20.65	1.9453	16	31	24.5	10.624
6	8	53	17.29	1.9426	16	20	44.9	10.695
7	8	55	13.76	1.9398	16	10	1.1	10.765
8	8	57	10.07	1.9372	15	59	13.1	10.834
9	8	59	6.22	1.9344	15	48	21.0	10.903
10	9	1	2.20	1.9318	15	37	24.7	10.972
11	9	2	58.03	1.9292	15	26	24.4	11.039
12	9	4	53.70	1.9266	15	15	20.0	11.106
13	9	6	49.22	1.9241	15	4	11.7	11.172
14	9	8	44.59	1.9216	14	52	59.4	11.237
15	9	10	39.81	1.9191	14	41	43.3	11.301
16	9	12	34.88	1.9167	14	30	23.3	11.365
17	9	14	29.81	1.9143	14	18	59.5	11.428
18	9	16	24.59	1.9119	14	7	32.0	11.489
19	9	18	19.24	1.9097	13	56	0.8	11.550
20	9	20	13.75	1.9073	13	44	26.0	11.611
21	9	22	8.12	1.9051	13	32	47.5	11.671
22	9	24	2.36	1.9028	13	21	5.5	11.729
23	9	25	56.46	1.9007	+13	9	20.0	–11.788
AUGUST 27.								
0	9	27	50.44	1.8986	+12	57	31.0	–11.845
1	9	29	44.29	1.8965	12	45	38.6	11.902
2	9	31	38.02	1.8945	12	33	42.8	11.958
3	9	33	31.63	1.8925	12	21	43.7	12.013
4	9	35	25.12	1.8905	12	9	41.3	12.067
5	9	37	18.49	1.8886	11	57	35.7	12.120
6	9	39	11.75	1.8868	11	45	26.9	12.173
7	9	41	4.90	1.8849	11	33	15.0	12.224
8	9	42	57.94	1.8832	11	21	0.0	12.276
9	9	44	50.88	1.8815	11	8	41.9	12.327
10	9	46	43.72	1.8798	10	56	20.8	12.376
11	9	48	36.46	1.8782	10	43	56.8	12.424
12	9	50	29.10	1.8766	10	31	29.9	12.473
13	9	52	21.65	1.8750	10	19	0.1	12.520
14	9	54	14.10	1.8735	10	6	27.5	12.566
15	9	56	6.47	1.8722	9	53	52.2	12.612
16	9	57	58.76	1.8708	9	41	14.1	12.657
17	9	59	50.96	1.8694	9	28	33.4	12.700
18	10	1	43.09	1.8682	9	15	50.1	12.743
19	10	3	35.14	1.8669	9	3	4.2	12.786
20	10	5	27.12	1.8658	8	50	15.8	12.828
21	10	7	19.03	1.8646	8	37	24.9	12.868
22	10	9	10.87	1.8634	8	24	31.6	12.908
23	10	11	2.64	1.8624	8	11	35.9	12.948
24	10	12	54.36	1.8615	+ 7	58	37.9	–12.986

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AUGUST 28.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	h m s	s	° ′ ″	″
0	10 12 54.36	1.8615	+7 58 37.9	−12.986
1	10 14 46.02	1.8606	7 45 37.6	13.023
2	10 16 37.63	1.8598	7 32 35.1	13.060
3	10 18 29.19	1.8589	7 19 30.4	13.096
4	10 20 20.70	1.8581	7 6 23.6	13.132
5	10 22 12.16	1.8574	6 53 14.6	13.167
6	10 24 3.59	1.8568	6 40 3.6	13.199
7	10 25 54.98	1.8562	6 26 50.7	13.232
8	10 27 46.33	1.8557	6 13 35.8	13.264
9	10 29 37.66	1.8553	6 0 19.0	13.296
10	10 31 28.96	1.8548	5 47 0.3	13.326
11	10 33 20.23	1.8543	5 33 39.9	13.355
12	10 35 11.48	1.8541	5 20 17.7	13.384
13	10 37 2.72	1.8538	5 6 53.8	13.412
14	10 38 53.94	1.8536	4 53 28.3	13.438
15	10 40 45.15	1.8535	4 40 1.2	13.464
16	10 42 36.36	1.8534	4 26 32.6	13.490
17	10 44 27.56	1.8534	4 13 2.4	13.515
18	10 46 18.77	1.8535	3 59 30.8	13.538
19	10 48 9.98	1.8535	3 45 57.8	13.561
20	10 50 1.19	1.8537	3 32 23.5	13.583
21	10 51 52.42	1.8539	3 18 47.9	13.604
22	10 53 43.66	1.8542	3 5 11.0	13.625
23	10 55 34.92	1.8545	+2 51 32.9	−13.644

AUGUST 29.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
0	10 57 26.20	1.8549	+2 37 53.7	−13.663
1	10 59 17.51	1.8554	2 24 13.4	13.680
2	11 1 8.85	1.8559	2 10 32.1	13 697
3	11 3 0.22	1.8565	1 56 49.8	13.713
4	11 4 51.63	1.8572	1 43 6.6	13.728
5	11 6 43.08	1.8578	1 29 22.5	13.743
6	11 8 34.57	1.8586	1 15 37.5	13.756
7	11 10 26.11	1.8594	1 1 51.8	13.768
8	11 12 17.70	1.8603	0 48 5.3	13.780
9	11 14 9.35	1.8613	0 34 18.2	13.791
10	11 16 1.05	1.8623	0 20 30.4	13.801
11	11 17 52.82	1.8633	+0 6 42.1	13.810
12	11 19 44.65	1.8645	−0 7 6.8	13.818
13	11 21 36.56	1.8658	0 20 56.1	13.825
14	11 23 28.54	1.8670	0 34 45.8	13.832
15	11 25 20.60	1.8683	0 48 35.9	13.838
16	11 27 12.74	1.8697	1 2 26.3	13.842
17	11 29 4.96	1.8712	1 16 16.9	13.845
18	11 30 57.28	1.8728	1 30 7.7	13.848
19	11 32 49.69	1.8743	1 43 58.7	13.850
20	11 34 42.19	1.8759	1 57 49.7	13.851
21	11 36 34.80	1.8777	2 11 40.8	13.851
22	11 38 27.51	1.8794	2 25 31.8	13.850
23	11 40 20.33	1.8813	2 39 22.8	13.848
24	11 42 13.27	1.8833	−2 53 13.6	−13.845

AUGUST 30.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	h m s	s	° ′ ″	″
0	11 42 13.27	1.8833	− 2 53 13.6	−13.845
1	11 44 6.32	1.8852	3 7 4.2	13.841
2	11 45 59.49	1.8873	3 20 54.5	13.836
3	11 47 52.79	1.8893	3 34 44.6	13.832
4	11 49 46.21	1.8915	3 48 34.3	13.825
5	11 51 39.77	1.8938	4 2 23.6	13.816
6	11 53 33.47	1.8962	4 16 12.4	13.806
7	11 55 27.31	1.8985	4 30 0.6	13.796
8	11 57 21.29	1.9009	4 43 48.2	13.784
9	11 59 15.42	1.9034	4 57 35.2	13.773
10	12 1 9.70	1.9060	5 11 21.5	13.760
11	12 3 4.14	1.9087	5 25 7.0	13.746
12	12 4 58.74	1.9113	5 38 51.7	13.733
13	12 6 53.50	1.9141	5 52 35.5	13.720
14	12 8 48.43	1.9170	6 6 18.3	13.705
15	12 10 43.54	1.9199	6 20 0.1	13.688
16	12 12 38.82	1.9229	6 33 40.9	13.670
17	12 14 34.29	1.9260	6 47 20.5	13.650
18	12 16 29.94	1.9290	7 0 58.9	13.630
19	12 18 25.77	1.9322	7 14 36.1	13.608
20	12 20 21.80	1.9354	7 28 11.9	13.586
21	12 22 18.02	1.9388	7 41 46.4	13.563
22	12 24 14.45	1.9422	7 55 19.4	13.538
23	12 26 11.08	1.9456	− 8 8 50.9	−13.513

AUGUST 31.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
0	12 28 7.92	1.9491	− 8 22 20.9	−13.486
1	12 30 4.97	1.9527	8 35 49.2	13.456
2	12 32 2.24	1.9563	8 49 15.9	13.429
3	12 33 59.73	1.9600	9 2 40.8	13.399
4	12 35 57.44	1.9638	9 16 3.8	13.368
5	12 37 55.38	1.9676	9 29 25.0	13.337
6	12 39 53.55	1.9715	9 42 44.2	13.305
7	12 41 51.96	1.9755	9 56 1.4	13.270
8	12 43 50.61	1.9795	10 9 16.5	13.234
9	12 45 49.50	1.9836	10 22 29.5	13.198
10	12 47 48.64	1.9878	10 35 40.2	13.160
11	12 49 48.03	1.9919	10 48 48.7	13.122
12	12 51 47.67	1.9963	11 1 54.8	13.082
13	12 53 47.58	2.0007	11 14 58.5	13.041
14	12 55 47.75	2.0050	11 27 59.7	12.998
15	12 57 48.18	2.0094	11 40 58.3	12.953
16	12 59 48.88	2.0140	11 53 54.3	12.911
17	13 1 49.86	2.0187	12 6 47.6	12.865
18	13 3 51.12	2.0233	12 19 38.1	12.818
19	13 5 52.66	2.0280	12 32 25.8	12.771
20	13 7 54.48	2.0328	12 45 10.6	12.722
21	13 9 56.59	2.0377	12 57 52.4	12.672
22	13 11 59.00	2.0426	13 10 31.2	12.621
23	13 14 1.70	2.0475	13 23 6.9	12.568
24	13 16 4.70	2.0525	−13 35 39.3	−12.512

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	SEPTEMBER 1.					**SEPTEMBER 3.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	13 16 4.70	2.0525	−13 35 39.3	−12.513	0	15 1 16.94	2.3433	−22 9 46.3	−8.388
1	13 18 8.00	2.0576	13 48 8.5	12.458	1	15 3 37.73	2.3498	22 18 6.0	8.268
2	13 20 11.61	2.0628	14 0 34.3	12.402	2	15 5 58.91	2.3563	22 26 18.5	8.148
3	13 22 15.53	2.0679	14 12 56.7	12.344	3	15 8 20.48	2.3627	22 34 23.7	8.025
4	13 24 19.76	2.0732	14 25 15.6	12.286	4	15 10 42.43	2.3691	22 42 21.5	7.901
5	13 26 24.31	2.0785	14 37 31.0	12.226	5	15 13 4.77	2.3756	22 50 11.8	7.776
6	13 28 29.18	2.0839	14 49 42.7	12.164	6	15 15 27.50	2.3820	22 57 54.6	7.649
7	13 30 34.38	2.0893	15 1 50.7	12.103	7	15 17 50.61	2.3884	23 5 29.7	7.521
8	13 32 39.90	2.0948	15 13 55.0	12.038	8	15 20 14.11	2.3948	23 12 57.1	7.392
9	13 34 45.75	2.1003	15 25 55.3	11.973	9	15 22 37.99	2.4011	23 20 16.7	7.261
10	13 36 51.93	2.1058	15 37 51.7	11.908	10	15 25 2.24	2.4073	23 27 28.4	7.128
11	13 38 58.45	2.1114	15 49 44.2	11.840	11	15 27 26.87	2.4136	23 34 32.1	6.995
12	13 41 5.30	2.1170	16 1 32.5	11.770	12	15 29 51.87	2.4198	23 41 27.8	6.861
13	13 43 12.49	2.1228	16 13 16.6	11.700	13	15 32 17.25	2.4260	23 48 15.4	6.724
14	13 45 20.03	2.1286	16 24 56.5	11.629	14	15 34 42.99	2.4321	23 54 54.7	6.586
15	13 47 27.92	2.1344	16 36 32.1	11.556	15	15 37 9.10	2.4382	24 1 25.7	6.448
16	13 49 36.16	2.1403	16 48 3.2	11.482	16	15 39 35.57	2.4443	24 7 48.4	6.308
17	13 51 44.75	2.1462	16 59 29.9	11.407	17	15 42 2.41	2.4503	24 14 2.6	6.166
18	13 53 53.70	2.1521	17 10 52.0	11.329	18	15 44 29.60	2.4561	24 20 8.3	6.023
19	13 56 3.00	2.1581	17 22 9.4	11.251	19	15 46 57.14	2.4620	24 26 5.4	5.879
20	13 58 12.67	2.1642	17 33 22.1	11.172	20	15 49 25.04	2.4678	24 31 53.8	5.733
21	14 0 22.70	2.1702	17 44 30.0	11.092	21	15 51 53.28	2.4736	24 37 33.4	5.587
22	14 2 33.09	2.1763	17 55 33.1	11.010	22	15 54 21.87	2.4793	24 43 4.2	5.439
23	14 4 43.85	2.1824	−18 6 31.2	−10.926	23	15 56 50.79	2.4848	−24 48 26.1	−5.291
	SEPTEMBER 2.					**SEPTEMBER 4.**			
0	14 6 54.98	2.1886	−18 17 24.2	−10.841	0	15 59 20.05	2.4904	−24 53 39.1	−5.141
1	14 9 6.48	2.1948	18 28 12.1	10.755	1	16 1 49.64	2.4959	24 58 43.0	4.989
2	14 11 18.35	2.2010	18 38 54.8	10.667	2	16 4 19.56	2.5013	25 3 37.8	4.837
3	14 13 30.60	2.2073	18 49 32.1	10.578	3	16 6 49.80	2.5066	25 8 23.4	4.683
4	14 15 43.23	2.2137	19 0 4.1	10.488	4	16 9 20.35	2.5118	25 12 59.7	4.528
5	14 17 56.24	2.2199	19 10 30.6	10.396	5	16 11 51.22	2.5170	25 17 26.7	4.372
6	14 20 9.62	2.2263	19 20 51.6	10.303	6	16 14 22.39	2.5220	25 21 44.3	4.214
7	14 22 23.39	2.2327	19 31 7.0	10.209	7	16 16 53.86	2.5269	25 25 52.4	4.056
8	14 24 37.54	2.2391	19 41 16.7	10.113	8	16 19 25.62	2.5318	25 29 51.0	3.897
9	14 26 52.08	2.2456	19 51 20.6	10.016	9	16 21 57.68	2.5367	25 33 40.0	3.737
10	14 29 7.01	2.2520	20 1 18.6	9.917	10	16 24 30.02	2.5413	25 37 19.4	3.576
11	14 31 22.32	2.2584	20 11 10.6	9.817	11	16 27 2.63	2.5458	25 40 49.1	3.413
12	14 33 38.02	2.2649	20 20 56.6	9.716	12	16 29 35.52	2.5504	25 44 9.0	3.249
13	14 35 54.11	2.2714	20 30 36.5	9.613	13	16 32 8.68	2.5548	25 47 19.0	3.085
14	14 38 10.59	2.2779	20 40 10.1	9.508	14	16 34 42.09	2.5589	25 50 19.2	2.920
15	14 40 27.46	2.2844	20 49 37.5	9.403	15	16 37 15.75	2.5631	25 53 9.4	2.754
16	14 42 44.72	2.2909	20 58 58.5	9.296	16	16 39 49.66	2.5672	25 55 49.7	2.588
17	14 45 2.37	2.2975	21 8 13.0	9.187	17	16 42 23.81	2.5711	25 58 19.9	2.418
18	14 47 20.42	2.3041	21 17 20.9	9.077	18	16 44 58.19	2.5749	26 0 39.9	2.249
19	14 49 38.86	2.3106	21 26 22.2	8.966	19	16 47 32.80	2.5787	26 2 49.8	2.080
20	14 51 57.69	2.3171	21 35 16.8	8.853	20	16 50 7.63	2.5823	26 4 49.5	1.910
21	14 54 16.91	2.3237	21 44 4.6	8.739	21	16 52 42.67	2.5857	26 6 39.0	1.739
22	14 56 36.53	2.3303	21 52 45.5	8.623	22	16 55 17.91	2.5890	26 8 18.2	1.567
23	14 58 56.54	2.3368	22 1 19.4	8.507	23	16 57 53.35	2.5923	26 9 47.0	1.394
24	15 1 16.94	2.3433	−22 9 46.3	− 8.388	24	17 0 28.98	2.5953	−26 11 5.5	−1.222

GREENWICH MEAN TIME.

Hour.	Right Ascension.			Var. per Min.	Declination.			Var. per Min.
SEPTEMBER 5.								
	h	m	s	s	°	′	″	″
0	17	0	28.98	2.5953	−26	11	5.5	−1.222
1	17	3	4.79	2.5983	26	12	13.6	1.048
2	17	5	40.77	2.6011	26	13	11.2	0.873
3	17	8	16.92	2.6038	26	13	58.3	0.698
4	17	10	53.23	2.6064	26	14	34.9	0.523
5	17	13	29.69	2.6088	26	15	1.0	0.347
6	17	16	6.29	2.6111	26	15	16.5	−0.170
7	17	18	43.02	2.6133	26	15	21.4	+0.008
8	17	21	19.88	2.6153	26	15	15.6	0.185
9	17	23	56.85	2.6172	26	14	59.2	0.363
10	17	26	33.94	2.6190	26	14	32.1	0.541
11	17	29	11.13	2.6206	26	13	54.3	0.720
12	17	31	48.41	2.6221	26	13	5.7	0.899
13	17	34	25.78	2.6234	26	12	6.4	1.078
14	17	37	3.22	2.6245	26	10	56.4	1.257
15	17	39	40.72	2.6255	26	9	35.6	1.437
16	17	42	18.28	2.6265	26	8	4.0	1.617
17	17	44	55.90	2.6273	26	6	21.6	1.796
18	17	47	33.56	2.6279	26	4	28.5	1.976
19	17	50	11.25	2.6284	26	2	24.5	2.156
20	17	52	48.97	2.6288	26	0	9.8	2.335
21	17	55	26.70	2.6289	25	57	44.3	2.515
22	17	58	4.44	2.6290	25	55	8.0	2.695
23	18	0	42.18	2.6289	−25	52	20.9	+2.875
SEPTEMBER 6.								
0	18	3	19.91	2.6288	−25	49	23.0	+3.055
1	18	5	57.63	2.6284	25	46	14.3	3.234
2	18	8	35.32	2.6278	25	42	54.9	3.413
3	18	11	12.97	2.6272	25	39	24.7	3.593
4	18	13	50.58	2.6264	25	35	43.8	3.771
5	18	16	28.14	2.6256	25	31	52.2	3.949
6	18	19	5.65	2.6246	25	27	49.9	4.128
7	18	21	43.09	2.6234	25	23	36.9	4.305
8	18	24	20.46	2.6221	25	19	13.3	4.482
9	18	26	57.74	2.6207	25	14	39.1	4.658
10	18	29	34.94	2.6192	25	9	54.3	4.835
11	18	32	12.04	2.6174	25	4	58.9	5.012
12	18	34	49.03	2.6156	24	59	52.9	5.188
13	18	37	25.91	2.6137	24	54	36.4	5.362
14	18	40	2.67	2.6116	24	49	9.5	5.535
15	18	42	39.30	2.6094	24	43	32.2	5.708
16	18	45	15.80	2.6072	24	37	44.5	5.882
17	18	47	52.16	2.6048	24	31	46.4	6.053
18	18	50	28.37	2.6022	24	25	38.1	6.224
19	18	53	4.42	2.5995	24	19	19.5	6.395
20	18	55	40.31	2.5968	24	12	50.7	6.564
21	18	58	16.04	2.5940	24	6	11.8	6.733
22	19	0	51.59	2.5910	23	59	22.8	6.900
23	19	3	26.96	2.5879	23	52	23.8	7.068
24	*19*	*6*	*2.14*	*2.5848*	*−23*	*45*	*14.7*	+7.234

Hour.	Right Ascension.			Var. per Min.	Declination.		
SEPTEMBER 7.							
	h	m	s	s	°	′	″
0	19	6	2.14	2.5848	−23	45	14.7
1	19	8	37.13	2.5815	23	37	55.7
2	19	11	11.92	2.5782	23	30	26.9
3	19	13	46.51	2.5748	23	22	48.3
4	19	16	20.89	2.5713	23	14	59.9
5	19	18	55.06	2.5676	23	7	1.8
6	19	21	29.00	2.5638	22	58	54.2
7	19	24	2.72	2.5601	22	50	37.0
8	19	26	36.21	2.5563	22	42	10.3
9	19	29	9.47	2.5523	22	33	34.2
10	19	31	42.48	2.5482	22	24	48.8
11	19	34	15.25	2.5442	22	15	54.1
12	19	36	47.78	2.5400	22	6	50.2
13	19	39	20.05	2.5358	21	57	37.2
14	19	41	52.07	2.5314	21	48	15.2
15	19	44	23.82	2.5270	21	38	44.3
16	19	46	55.31	2.5227	21	29	4.5
17	19	49	26.54	2.5182	21	19	16.0
18	19	51	57.49	2.5136	21	9	18.8
19	19	54	28.17	2.5091	20	59	12.9
20	19	56	58.58	2.5045	20	48	58.5
21	19	59	28.71	2.4998	20	38	35.7
22	20	1	58.56	2.4952	20	28	4.5
23	20	4	28.13	2.4904	−20	17	25.1
SEPTEMBER 8.							
0	20	6	57.41	2.4856	−20	6	37.5
1	20	9	26.40	2.4808	19	55	41.9
2	20	11	55.11	2.4760	19	44	38.3
3	20	14	23.52	2.4711	19	33	26.8
4	20	16	51.64	2.4662	19	22	7.5
5	20	19	19.46	2.4613	19	10	40.5
6	20	21	46.99	2.4563	18	59	6.0
7	20	24	14.22	2.4513	18	47	23.9
8	20	26	41.15	2.4463	18	35	34.5
9	20	29	7.78	2.4414	18	23	37.8
10	20	31	34.12	2.4365	18	11	33.8
11	20	34	0.16	2.4314	17	59	22.8
12	20	36	25.89	2.4263	17	47	4.8
13	20	38	51.32	2.4214	17	34	39.9
14	20	41	16.46	2.4164	17	22	8.2
15	20	43	41.29	2.4113	17	9	29.9
16	20	46	5.82	2.4063	16	56	44.9
17	20	48	30.05	2.4013	16	43	53.5
18	20	50	53.98	2.3964	16	30	55.8
19	20	53	17.62	2.3914	16	17	51.8
20	20	55	40.95	2.3864	16	4	41.6
21	20	58	3.99	2.3815	15	51	25.4
22	21	0	26.73	2.3765	15	38	3.3
23	21	2	49.17	2.3716	15	24	35.3
24	21	5	11.32	2.3668	−15	11	1.6

GREENWICH MEAN TIME.

our.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	SEPTEMBER 9.					SEPTEMBER 11.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	21 5 11.32	2.3668	−15 11 1.6	+13.608	0	22 53 53.36	2.1827	−3 4 1.8	+15.982
1	21 7 33.18	2.3618	14 57 22.3	13.700	1	22 56 4.25	2.1803	2 48 2.7	15.988
2	21 9 54.74	2.3569	14 43 37.6	13.791	2	22 58 15.00	2.1780	2 32 3.3	15.992
3	21 12 16.01	2.3521	14 29 47.4	13.881	3	23 0 25.61	2.1757	2 16 3.7	15.994
4	21 14 36.99	2.3473	14 15 51.9	13.968	4	23 2 36.08	2.1734	2 0 4.0	15.995
5	21 16 57.69	2.3426	14 1 51.3	14.053	5	23 4 46.42	2.1713	1 44 4.3	15.993
6	21 19 18.10	2.3378	13 47 45.6	14.136	6	23 6 56.64	2.1693	1 28 4.8	15.990
7	21 21 38.23	2.3332	13 33 35.0	14.218	7	23 9 6.74	2.1673	1 12 5.5	15.986
8	21 23 58.08	2.3284	13 19 19.5	14.298	8	23 11 16.72	2.1653	0 56 6.5	15.980
9	21 26 17.64	2.3238	13 4 59.3	14.375	9	23 13 26.58	2.1634	0 40 7.9	15.972
10	21 28 36.93	2.3193	12 50 34.5	14.451	10	23 15 36.33	2.1617	0 24 9.9	15.963
11	21 30 55.95	2.3147	12 36 5.2	14.526	11	23 17 45.98	2.1600	−0 8 12.4	15.952
12	21 33 14.69	2.3101	12 21 31.4	14.598	12	23 19 55.53	2.1583	+0 7 44.3	15.938
13	21 35 33.16	2.3057	12 6 53.4	14.668	13	23 22 4.98	2.1567	0 23 40.2	15.924
14	21 37 51.37	2.3013	11 52 11.2	14.738	14	23 24 14.33	2.1551	0 39 35.2	15.908
15	21 40 9.31	2.2968	11 37 24.9	14.804	15	23 26 23.59	2.1537	0 55 29.2	15.891
16	21 42 26.99	2.2925	11 22 34.7	14.868	16	23 28 32.77	2.1523	1 11 22.1	15.873
17	21 44 44.41	2.2882	11 7 40.7	14.932	17	23 30 41.87	2.1509	1 27 13.9	15.852
18	21 47 1.57	2.2839	10 52 42.9	14.993	18	23 32 50.88	2.1496	1 43 4.3	15.828
19	21 49 18.48	2.2797	10 37 41.5	15.053	19	23 34 59.82	2.1484	1 58 53.3	15.805
20	21 51 35.13	2.2755	10 22 36.6	15.110	20	23 37 8.69	2.1473	2 14 40.9	15.780
21	21 53 51.54	2.2715	10 7 28.3	15.166	21	23 39 17.49	2.1462	2 30 26.9	15.753
22	21 56 7.71	2.2674	9 52 16.7	15.219	22	23 41 26.23	2.1452	2 46 11.3	15.725
23	21 58 23.63	2.2634	− 9 37 2.0	+15.271	23	23 43 34.91	2.1443	+3 1 53.9	+15.696
	SEPTEMBER 10.					SEPTEMBER 12.			
0	22 0 39.32	2.2595	− 9 21 44.2	+15.321	0	23 45 43.54	2.1433	+3 17 34.7	+15.664
1	22 2 54.77	2.2556	9 6 23.5	15.369	1	23 47 52.11	2.1425	3 33 13.6	15.631
2	22 5 9.99	2.2518	8 50 59.9	15.416	2	23 50 0.64	2.1418	3 48 50.4	15.596
3	22 7 24.98	2.2479	8 35 33.6	15.461	3	23 52 9.12	2.1410	4 4 25.1	15.560
4	22 9 39.74	2.2442	8 20 4.6	15.504	4	23 54 17.56	2.1404	4 19 57.6	15.523
5	22 11 54.28	2.2406	8 4 33.1	15.544	5	23 56 25.97	2.1398	4 35 27.8	15.484
6	22 14 8.61	2.2370	7 48 59.3	15.583	6	23 58 34.34	2.1393	4 50 55.7	15.444
7	22 16 22.72	2.2334	7 33 23.1	15.621	7	0 0 42.68	2.1388	5 6 21.1	15.403
8	22 18 36.62	2.2299	7 17 44.8	15.656	8	0 2 50.99	2.1383	5 21 44.0	15.359
9	22 20 50.31	2.2265	7 2 4.4	15.690	9	0 4 59.28	2.1381	5 37 4.2	15.314
10	22 23 3.80	2.2232	6 46 22.0	15.723	10	0 7 7.56	2.1378	5 52 21.7	15.268
11	22 25 17.09	2.2198	6 30 37.7	15.753	11	0 9 15.82	2.1375	6 7 36.4	15.222
12	22 27 30.18	2.2166	6 14 51.7	15.780	12	0 11 24.06	2.1373	6 22 48.3	15.173
13	22 29 43.08	2.2134	5 59 4.1	15.807	13	0 13 32.30	2.1373	6 37 57.2	15.123
14	22 31 55.79	2.2103	5 43 14.9	15.832	14	0 15 40.53	2.1372	6 53 3.0	15.071
15	22 34 8.32	2.2073	5 27 24.3	15.854	15	0 17 48.76	2.1372	7 8 5.7	15.018
16	22 36 20.66	2.2043	5 11 32.4	15.876	16	0 19 56.99	2.1373	7 23 5.2	14.964
17	22 38 32.83	2.2013	4 55 39.2	15.896	17	0 22 5.23	2.1374	7 38 1.4	14.909
18	22 40 44.82	2.1985	4 39 44.9	15.913	18	0 24 13.48	2.1376	7 52 54.3	14.853
19	22 42 56.65	2.1958	4 23 49.6	15.929	19	0 26 21.74	2.1378	8 7 43.7	14.794
20	22 45 8.31	2.1929	4 7 53.4	15.943	20	0 28 30.01	2.1380	8 22 29.6	14.734
21	22 47 19.80	2.1903	3 51 56.5	15.955	21	0 30 38.30	2.1383	8 37 11.8	14.673
22	22 49 31.14	2.1878	3 35 58.8	15.967	22	0 32 46.61	2.1387	8 51 50.4	14.613
23	22 51 42.33	2.1852	3 20 0.5	15.975	23	0 34 54.94	2.1391	9 6 25.3	14.549
24	22 53 53.36	2.1827	− *3 4 1.8*	*+15.982*	24	0 37 3.30	2.1396	+9 20 56.3	+14.484

GREENWICH MEAN TIME.

SEPTEMBER 13.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	h m s	s	° ′ ″	″
0	0 37 3.30	2.1396	+ 9 20 56.3	+14.484
1	0 39 11.69	2.1402	9 35 23.4	14.418
2	0 41 20.12	2.1408	9 49 46.5	14.352
3	0 43 28.58	2.1413	10 4 5.6	14.283
4	0 45 37.08	2.1420	10 18 20.5	14.213
5	0 47 45.62	2.1427	10 32 31.2	14.143
6	0 49 54.20	2.1434	10 46 37.7	14.072
7	0 52 2.83	2.1443	11 0 39.8	13.998
8	0 54 11.51	2.1451	11 14 37.5	13.924
9	0 56 20.24	2.1459	11 28 30.7	13.849
10	0 58 29.02	2.1468	11 42 19.4	13.773
11	1 0 37.86	2.1478	11 56 3.4	13.694
12	1 2 46.76	2.1488	12 9 42.7	13.616
13	1 4 55.72	2.1499	12 23 17.3	13.536
14	1 7 4.75	2.1510	12 36 47.0	13.454
15	1 9 13.84	2.1521	12 50 11.8	13.373
16	1 11 23.00	2.1533	13 3 31.7	13.289
17	1 13 32.23	2.1544	13 16 46.5	13.205
18	1 15 41.53	2.1557	13 29 56.3	13.120
19	1 17 50.91	2.1569	13 43 0.9	13.033
20	1 20 0.36	2.1582	13 56 0.3	12.946
21	1 22 9.89	2.1595	14 8 54.4	12.858
22	1 24 19.50	2.1608	14 21 43.2	12.768
23	1 26 29.19	2.1622	+14 34 26.6	+12.678

SEPTEMBER 14.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
0	1 28 38.96	2.1636	+14 47 4.5	+12.586
1	1 30 48.82	2.1651	14 59 36.9	12.493
2	1 32 58.77	2.1665	15 12 3.7	12.400
3	1 35 8.80	2.1679	15 24 24.9	12.306
4	1 37 18.92	2.1695	15 36 40.4	12.210
5	1 39 29.14	2.1710	15 48 50.1	12.113
6	1 41 39.44	2.1725	16 0 54.0	12.017
7	1 43 49.84	2.1741	16 12 52.1	11.918
8	1 46 0.33	2.1757	16 24 44.2	11.819
9	1 48 10.92	2.1773	16 36 30.4	11.719
10	1 50 21.61	2.1789	16 48 10.5	11.618
11	1 52 32.39	2.1805	16 59 44.5	11.516
12	1 54 43.27	2.1822	17 11 12.4	11.413
13	1 56 54.25	2.1838	17 22 34.1	11.310
14	1 59 5.33	2.1855	17 33 49.6	11.206
15	2 1 16.51	2.1873	17 44 58.8	11.101
16	2 3 27.80	2.1889	17 56 1.7	10.995
17	2 5 39.18	2.1906	18 6 58.2	10.888
18	2 7 50.67	2.1923	18 17 48.2	10.780
19	2 10 2.26	2.1940	18 28 31.8	10.672
20	2 12 13.95	2.1957	18 39 8.8	10.563
21	2 14 25.74	2.1973	18 49 39.3	10.453
22	2 16 37.63	2.1991	19 0 3.1	10.342
23	2 18 49.63	2.2008	19 10 20.3	10.231
24	2 21 1.73	2.2025	+19 20 30.8	+10.118

SEPTEMBER 15.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	h m s	s	° ′ ″	″
0	2 21 1.73	2.2025	+19 20 30.8	+10.118
1	2 23 13.93	2.2043	19 30 34.5	10.006
2	2 25 26.24	2.2060	19 40 31.4	9.893
3	2 27 38.65	2.2077	19 50 21.5	9.778
4	2 29 51.16	2.2093	20 0 4.7	9.663
5	2 32 3.77	2.2110	20 9 41.0	9.547
6	2 34 16.48	2.2128	20 19 10.3	9.431
7	2 36 29.30	2.2144	20 28 32.7	9.314
8	2 38 42.21	2.2160	20 37 48.0	9.196
9	2 40 55.22	2.2177	20 46 56.2	9.078
10	2 43 8.33	2.2193	20 55 57.3	8.959
11	2 45 21.54	2.2210	21 4 51.3	8.840
12	2 47 34.85	2.2226	21 13 38.1	8.720
13	2 49 48.25	2.2241	21 22 17.7	8.599
14	2 52 1.74	2.2257	21 30 50.0	8.478
15	2 54 15.33	2.2273	21 39 15.1	8.357
16	2 56 29.01	2.2288	21 47 32.8	8.234
17	2 58 42.78	2.2303	21 55 43.2	8.112
18	3 0 56.65	2.2318	22 3 46.2	7.988
19	3 3 10.60	2.2332	22 11 41.8	7.864
20	3 5 24.63	2.2346	22 19 29.9	7.740
21	3 7 38.75	2.2360	22 27 10.6	7.616
22	3 9 52.95	2.2374	22 34 43.8	7.490
23	3 12 7.24	2.2388	+22 42 9.4	+ 7.364

SEPTEMBER 16.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
0	3 14 21.61	2.2402	+22 49 27.5	+ 7.239
1	3 16 36.06	2.2414	22 56 38.1	7.113
2	3 18 50.58	2.2426	23 3 41.0	6.985
3	3 21 5.17	2.2438	23 10 36.3	6.858
4	3 23 19.83	2.2450	23 17 23.9	6.730
5	3 25 34.57	2.2462	23 24 3.9	6.603
6	3 27 49.37	2.2473	23 30 36.2	6.474
7	3 30 4.24	2.2483	23 37 0.8	6.346
8	3 32 19.17	2.2493	23 43 17.7	6.217
9	3 34 34.16	2.2503	23 49 26.8	6.087
10	3 36 49.21	2.2513	23 55 28.1	5.957
11	3 39 4.32	2.2523	24 1 21.6	5.827
12	3 41 19.48	2.2531	24 7 7.3	5.697
13	3 43 34.69	2.2539	24 12 45.2	5.567
14	3 45 49.95	2.2547	24 18 15.3	5.436
15	3 48 5.25	2.2554	24 23 37.5	5.304
16	3 50 20.60	2.2562	24 28 51.8	5.173
17	3 52 35.99	2.2568	24 33 58.2	5.042
18	3 54 51.41	2.2573	24 38 56.8	4.910
19	3 57 6.86	2.2578	24 43 47.4	4.778
20	3 59 22.35	2.2583	24 48 30.1	4.646
21	4 1 37.86	2.2587	24 53 4.9	4.514
22	4 3 53.39	2.2591	24 57 31.8	4.382
23	4 6 8.95	2.2595	25 1 50.7	4.248
24	4 8 24.53	2.2598	+25 6 1.6	+ 4.116

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	SEPTEMBER 17.			
	h m s	s	° ′ ″	″
0	4 8 24.53	2.2598	+25 6 1.6	+4.116
1	4 10 40.12	2.2600	25 10 4.6	3.983
2	4 12 55.73	2.2602	25 13 59.6	3.851
3	4 15 11.34	2.2603	25 17 46.7	3.718
4	4 17 26.96	2.2603	25 21 25.8	3.585
5	4 19 42.58	2.2603	25 24 56.9	3.452
6	4 21 58.20	2.2603	25 28 20.0	3.318
7	4 24 13.81	2.2602	25 31 35.1	3.185
8	4 26 29.42	2.2600	25 34 42.2	3.052
9	4 28 45.01	2.2598	25 37 41.3	2.919
10	4 31 0.59	2.2595	25 40 32.5	2.787
11	4 33 16.15	2.2592	25 43 15.7	2.653
12	4 35 31.69	2.2588	25 45 50.9	2.520
13	4 37 47.21	2.2583	25 48 18.1	2.387
14	4 40 2.69	2.2578	25 50 37.3	2.254
15	4 42 18.14	2.2573	25 52 48.6	2.122
16	4 44 33.56	2.2567	25 54 51.9	1.988
17	4 46 48.94	2.2559	25 56 47.2	1.855
18	4 49 4.27	2.2552	25 58 34.5	1.723
19	4 51 19.56	2.2544	26 0 13.9	1.591
20	4 53 34.80	2.2536	26 1 45.4	1.458
21	4 55 49.99	2.2527	26 3 8.9	1.326
22	4 58 5.12	2.2517	26 4 24.5	1.194
23	5 0 20.19	2.2506	+26 5 32.2	+1.063
	SEPTEMBER 18.			
0	5 2 35.19	2.2495	+26 6 32.0	+0.931
1	5 4 50.13	2.2483	26 7 23.9	0.799
2	5 7 4.99	2.2471	26 8 7.9	0.668
3	5 9 19.78	2.2459	26 8 44.0	0.536
4	5 11 34.50	2.2446	26 9 12.2	0.405
5	5 13 49.13	2.2432	26 9 32.6	0.275
6	5 16 3.68	2.2418	26 9 45.2	0.144
7	5 18 18.14	2.2403	26 9 49.9	+0.013
8	5 20 32.51	2.2387	26 9 46.8	−0.117
9	5 22 46.78	2.2371	26 9 35.9	0.246
10	5 25 0.96	2.2354	26 9 17.3	0.375
11	5 27 15.03	2.2337	26 8 50.9	0.504
12	5 29 29.00	2.2319	26 8 16.8	0.633
13	5 31 42.86	2.2301	26 7 35.0	0.761
14	5 33 56.61	2.2282	26 6 45.5	0.889
15	5 36 10.24	2.2263	26 5 48.3	1.018
16	5 38 23.76	2.2243	26 4 43.4	1.145
17	5 40 37.16	2.2223	26 3 30.9	1.272
18	5 42 50.43	2.2202	26 2 10.8	1.398
19	5 45 3.58	2.2181	26 0 43.1	1.524
20	5 47 16.60	2.2158	25 59 7.9	1.650
21	5 49 29.48	2.2135	25 57 25.1	1.776
22	5 51 42.22	2.2113	25 55 34.8	1.901
23	5 53 54.83	2.2090	25 53 37.0	2.026
24	*5 56 7.30*	*2.2066*	*+25 51 31.7*	*−2.150*

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	SEPTEMBER 19.			
	h m s	s	° ′ ″	″
0	5 56 7.30	2.2066	+25 51 31.7	−2.150
1	5 58 19.62	2.2042	25 49 19.0	2.274
2	6 0 31.80	2.2018	25 46 58.8	2.398
3	6 2 43.83	2.1993	25 44 31.3	2.520
4	6 4 55.71	2.1967	25 41 56.4	2.643
5	6 7 7.43	2.1940	25 39 14.2	2.764
6	6 9 18.99	2.1914	25 36 24.7	2.886
7	6 11 30.40	2.1888	25 33 27.9	3.007
8	6 13 41.64	2.1860	25 30 23.9	3.128
9	6 15 52.72	2.1833	25 27 12.6	3.248
10	6 18 3.63	2.1804	25 23 54.2	3.367
11	6 20 14.37	2.1776	25 20 28.6	3.486
12	6 22 24.94	2.1748	25 16 55.9	3.604
13	6 24 35.34	2.1718	25 13 16.1	3.723
14	6 26 45.56	2.1689	25 9 29.2	3.840
15	6 28 55.61	2.1660	25 5 35.3	3.957
16	6 31 5.48	2.1630	25 1 34.4	4.073
17	6 33 15.17	2.1599	24 57 26.5	4.189
18	6 35 24.67	2.1568	24 53 11.7	4.304
19	6 37 33.99	2.1538	24 48 50.0	4.419
20	6 39 43.12	2.1507	24 44 21.4	4.533
21	6 41 52.07	2.1476	24 39 46.0	4.648
22	6 44 0.83	2.1444	24 35 3.7	4.761
23	6 46 9.40	2.1412	+24 30 14.7	−4.873
	SEPTEMBER 20.			
0	6 48 17.77	2.1379	+24 25 19.0	−4.984
1	6 50 25.95	2.1348	24 20 16.6	5.096
2	6 52 33.94	2.1315	24 15 7.5	5.207
3	6 54 41.73	2.1283	24 9 51.8	5.317
4	6 56 49.33	2.1249	24 4 29.5	5.426
5	6 58 56.72	2.1216	23 59 0.7	5.535
6	7 1 3.92	2.1183	23 53 25.3	5.643
7	7 3 10.92	2.1150	23 47 43.5	5.751
8	7 5 17.72	2.1117	23 41 55.2	5.858
9	7 7 24.32	2.1083	23 36 0.5	5.964
10	7 9 30.72	2.1049	23 29 59.5	6.070
11	7 11 36.91	2.1015	23 23 52.1	6.176
12	7 13 42.90	2.0981	23 17 38.4	6.280
13	7 15 48.68	2.0947	23 11 18.5	6.383
14	7 17 54.26	2.0913	23 4 52.4	6.487
15	7 19 59.64	2.0879	22 58 20.1	6.590
16	7 22 4.81	2.0845	22 51 41.6	6.693
17	7 24 9.78	2.0811	22 44 57.0	6.793
18	7 26 14.54	2.0777	22 38 6.4	6.893
19	7 28 19.10	2.0743	22 31 9.8	6.993
20	7 30 23.45	2.0708	22 24 7.2	7.093
21	7 32 27.59	2.0673	22 16 58.6	7.193
22	7 34 31.53	2.0639	22 9 44.1	7.291
23	7 36 35.26	2.0605	22 2 23.7	7.388
24	7 38 38.79	2.0571	+21 54 57.6	−7.48

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	SEPTEMBER 21.					SEPTEMBER 23.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	7 38 38.79	2.0571	+21 54 57.6	− 7.483	0	9 13 45.32	1.9159	+14 17 9.3	−11.326
1	7 40 42.11	2.0537	21 47 25.7	7.580	1	9 15 40.21	1.9138	14 5 47.9	11.388
2	7 42 45.23	2.0503	21 39 48.0	7.676	2	9 17 34.97	1.9116	13 54 22.7	11.451
3	7 44 48.15	2.0469	21 32 4.6	7.771	3	9 19 29.60	1.9096	13 42 53.8	11.513
4	7 46 50.86	2.0435	21 24 15.5	7.865	4	9 21 24.11	1.9075	13 31 21.2	11.573
5	7 48 53.37	2.0402	21 16 20.8	7.958	5	9 23 18.50	1.9056	13 19 45.0	11.632
6	7 50 55.68	2.0368	21 8 20.5	8.051	6	9 25 12.78	1.9037	13 8 5.2	11.692
7	7 52 57.79	2.0334	21 0 14.7	8.143	7	9 27 6.94	1.9018	12 56 21.9	11.751
8	7 54 59.69	2.0300	20 52 3.4	8.234	8	9 29 0.99	1.8999	12 44 35.1	11.809
9	7 57 1.39	2.0268	20 43 46.6	8.325	9	9 30 54.93	1.8981	12 32 44.8	11.867
10	7 59 2.90	2.0234	20 35 24.4	8.415	10	9 32 48.76	1.8963	12 20 51.1	11.923
11	8 1 4.20	2.0201	20 26 56.8	8.504	11	9 34 42.49	1.8947	12 8 54.1	11.978
12	8 3 5.31	2.0168	20 18 23.9	8.593	12	9 36 36.12	1.8930	11 56 53.7	12.033
13	8 5 6.22	2.0135	20 9 45.7	8.681	13	9 38 29.65	1.8914	11 44 50.1	12.088
14	8 7 6.93	2.0103	20 1 2.2	8.768	14	9 40 23.09	1.8899	11 32 43.2	12.142
15	8 9 7.45	2.0071	19 52 13.5	8.855	15	9 42 16.44	1.8884	11 20 33.1	12.195
16	8 11 7.78	2.0038	19 43 19.6	8.942	16	9 44 9.70	1.8870	11 8 19.8	12.247
17	8 13 7.91	2.0006	19 34 20.5	9.027	17	9 46 2.88	1.8856	10 56 3.5	12.298
18	8 15 7.85	1.9974	19 25 16.4	9.111	18	9 47 55.97	1.8842	10 43 44.1	12.348
19	8 17 7.60	1.9943	19 16 7.2	9.195	19	9 49 48.98	1.8828	10 31 21.7	12.396
20	8 19 7.17	1.9913	19 6 53.0	9.278	20	9 51 41.91	1.8817	10 18 56.3	12.445
21	8 21 6.55	1.9881	18 57 33.9	9.360	21	9 53 34.78	1.8805	10 6 28.0	12.494
22	8 23 5.74	1.9850	18 48 9.8	9.443	22	9 55 27.57	1.8793	9 53 56.8	12.543
23	8 25 4.75	1.9819	+18 38 40.8	− 9.523	23	9 57 20.29	1.8782	+ 9 41 22.8	−12.590
	SEPTEMBER 22.					SEPTEMBER 24.			
0	8 27 3.57	1.9788	+18 29 7.0	− 9.603	0	9 59 12.95	1.8772	+ 9 28 46.0	−12.636
1	8 29 2.21	1.9759	18 19 28.4	9.683	1	10 1 5.55	1.8762	9 16 6.5	12.682
2	8 31 0.68	1.9729	18 9 45.0	9.763	2	10 2 58.09	1.8753	9 3 24.2	12.727
3	8 32 58.96	1.9699	17 59 56.9	9.841	3	10 4 50.58	1.8744	8 50 39.3	12.771
4	8 34 57.07	1.9671	17 50 4.1	9.919	4	10 6 43.02	1.8736	8 37 51.7	12.814
5	8 36 55.01	1.9642	17 40 6.6	9.996	5	10 8 35.41	1.8728	8 25 1.6	12.856
6	8 38 52.77	1.9613	17 30 4.6	10.072	6	10 10 27.76	1.8721	8 12 9.0	12.896
7	8 40 50.36	1.9585	17 19 58.0	10.148	7	10 12 20.06	1.8714	7 59 13.9	12.938
8	8 42 47.79	1.9558	17 9 46.9	10.223	8	10 14 12.33	1.8709	7 46 16.4	12.978
9	8 44 45.05	1.9529	16 59 31.3	10.297	9	10 16 4.57	1.8703	7 33 16.5	13.018
10	8 46 42.14	1.9502	16 49 11.3	10.370	10	10 17 56.77	1.8698	7 20 14.2	13.057
11	8 48 39.07	1.9474	16 38 46.9	10.443	11	10 19 48.94	1.8693	7 7 9.7	13.094
12	8 50 35.83	1.9448	16 28 18.1	10.516	12	10 21 41.09	1.8690	6 54 2.9	13.132
13	8 52 32.44	1.9422	16 17 45.0	10.587	13	10 23 33.22	1.8687	6 40 53.9	13.168
14	8 54 28.89	1.9396	16 7 7.7	10.657	14	10 25 25.33	1.8684	6 27 42.8	13.203
15	8 56 25.19	1.9371	15 56 26.2	10.727	15	10 27 17.43	1.8683	6 14 29.6	13.238
16	8 58 21.34	1.9346	15 45 40.5	10.797	16	10 29 9.52	1.8681	6 1 14.3	13.271
17	9 0 17.34	1.9321	15 34 50.6	10.865	17	10 31 1.60	1.8680	5 47 57.1	13.303
18	9 2 13.19	1.9296	15 23 56.7	10.933	18	10 32 53.68	1.8679	5 34 37.9	13.336
19	9 4 8.89	1.9272	15 12 58.7	11.000	19	10 34 45.75	1.8679	5 21 16.8	13.368
20	9 6 4.45	1.9248	15 1 56.7	11.067	20	10 36 37.83	1.8681	5 7 53.8	13.398
21	9 7 59.87	1.9225	14 50 50.7	11.133	21	10 38 29.92	1.8683	4 54 29.0	13.428
22	9 9 55.15	1.9203	14 39 40.8	11.198	22	10 40 22.02	1.8685	4 41 2.4	13.458
23	9 11 50.30	1.9181	14 28 27.0	11.263	23	10 42 14.14	1.8688	4 27 34.1	13.485
24	9 13 45.32	1.9159	+14 17 9.3	−11.326	24	10 44 6.27	1.8690	+ 4 14 4.2	−13.512

GREENWICH MEAN TIME.

Iour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	SEPTEMBER 25.			
	h m s	s	° ′ ″	″
0	10 44 6.27	1.8690	+4 14 4.2	–13.512
1	10 45 58.42	1.8694	4 0 32.7	13.538
2	10 47 50.60	1.8698	3 46 59.6	13.564
3	10 49 42.80	1.8703	3 33 25.0	13.589
4	10 51 35.04	1.8709	3 19 48.9	13.613
5	10 53 27.31	1.8716	3 6 11.5	13.635
6	10 55 19.63	1.8723	2 52 32.7	13.658
7	10 57 11.99	1.8730	2 38 52.5	13.680
8	10 59 4.39	1.8738	2 25 11.1	13.700
9	11 0 56.84	1.8747	2 11 28.5	13.719
10	11 2 49.35	1.8757	1 57 44.8	13.738
11	11 4 41.92	1.8767	1 44 0.0	13.756
12	11 6 34.55	1.8778	1 30 14.1	13.773
13	11 8 27.25	1.8788	1 16 27.2	13.789
14	11 10 20.01	1.8800	1 2 39.4	13.804
15	11 12 12.85	1.8813	0 48 50.7	13.818
16	11 14 5.77	1.8826	0 35 1.2	13.832
17	11 15 58.76	1.8839	0 21 10.9	13.844
18	11 17 51.84	1.8854	+0 7 19.9	13.857
19	11 19 45.01	1.8869	–0 6 31.9	13.868
20	11 21 38.27	1.8885	0 20 24.2	13.876
21	11 23 31.63	1.8902	0 34 17.0	13.885
22	11 25 25.09	1.8918	0 48 10.4	13.893
23	11 27 18.65	1.8935	–1 2 4.2	–13.899
	SEPTEMBER 26.			
0	11 29 12.31	1.8953	–1 15 58.3	–13.905
1	11 31 6.09	1.8973	1 29 52.8	13.911
2	11 32 59.98	1.8992	1 43 47.6	13.915
3	11 34 53.99	1.9013	1 57 42.6	13.918
4	11 36 48.13	1.9033	2 11 37.7	13.919
5	11 38 42.39	1.9054	2 25 32.9	13.921
6	11 40 36.78	1.9077	2 39 28.2	13.922
7	11 42 31.31	1.9099	2 53 23.5	13.921
8	11 44 25.97	1.9123	3 7 18.7	13.918
9	11 46 20.78	1.9147	3 21 13.7	13.915
10	11 48 15.73	1.9171	3 35 8.5	13.912
11	11 50 10.83	1.9197	3 49 3.1	13.907
12	11 52 6.09	1.9223	4 2 57.3	13.900
13	11 54 1.51	1.9249	4 16 51.1	13.893
14	11 55 57.08	1.9276	4 30 44.5	13.886
15	11 57 52.82	1.9304	4 44 37.4	13.877
16	11 59 48.73	1.9333	4 58 29.7	13.867
17	12 1 44.81	1.9362	5 12 21.4	13.855
18	12 3 41.07	1.9392	5 26 12.3	13.843
19	12 5 37.51	1.9422	5 40 2.5	13.829
20	12 7 34.13	1.9453	5 53 51.8	13.814
21	12 9 30.94	1.9484	6 7 40.2	13.799
22	12 11 27.94	1.9517	6 21 27.7	13.783
23	12 13 25.14	1.9550	6 35 14.1	13.765
24	12 15 22.54	1.9583	–6 48 59.5	–13.747

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	SEPTEMBER 27.			
	h m s	s	° ′ ″	″
0	12 15 22.54	1.9583	– 6 48 59.5	–13.747
1	12 17 20.14	1.9618	7 2 43.7	13.726
2	12 19 17.95	1.9653	7 16 26.6	13.704
3	12 21 15.97	1.9688	7 30 8.2	13.683
4	12 23 14.21	1.9724	7 43 48.5	13.660
5	12 25 12.66	1.9761	7 57 27.4	13.635
6	12 27 11.34	1.9798	8 11 4.7	13.609
7	12 29 10.24	1.9836	8 24 40.5	13.583
8	12 31 9.37	1.9875	8 38 14.6	13.554
9	12 33 8.74	1.9914	8 51 47.0	13.525
10	12 35 8.34	1.9953	9 5 17.6	13.495
11	12 37 8.18	1.9994	9 18 46.4	13.464
12	12 39 8.27	2.0035	9 32 13.3	13.431
13	12 41 8.60	2.0077	9 45 38.1	13.397
14	12 43 9.19	2.0119	9 59 0.9	13.362
15	12 45 10.03	2.0162	10 12 21.5	13.325
16	12 47 11.13	2.0206	10 25 39.9	13.288
17	12 49 12.50	2.0250	10 38 56.0	13.249
18	12 51 14.13	2.0293	10 52 9.8	13.209
19	12 53 16.02	2.0338	11 5 21.1	13.168
20	12 55 18.19	2.0384	11 18 29.9	13.125
21	12 57 20.63	2.0431	11 31 36.1	13.082
22	12 59 23.36	2.0478	11 44 39.7	13.037
23	13 1 26.37	2.0525	–11 57 40.5	–12.990
	SEPTEMBER 28.			
0	13 3 29.66	2.0573	–12 10 38.5	–12.943
1	13 5 33.24	2.0622	12 23 33.6	12.893
2	13 7 37.12	2.0671	12 36 25.7	12.843
3	13 9 41.29	2.0720	12 49 14.7	12.791
4	13 11 45.76	2.0770	13 2 0.6	12.738
5	13 13 50.53	2.0820	13 14 43.3	12.684
6	13 15 55.60	2.0872	13 27 22.7	12.629
7	13 18 0.99	2.0923	13 39 58.8	12.573
8	13 20 6.68	2.0975	13 52 31.4	12.514
9	13 22 12.69	2.1028	14 5 0.5	12.455
10	13 24 19.01	2.1080	14 17 26.0	12.394
11	13 26 25.65	2.1134	14 29 47.8	12.332
12	13 28 32.62	2.1188	14 42 5.8	12.268
13	13 30 39.91	2.1242	14 54 20.0	12.203
14	13 32 47.52	2.1297	15 6 30.2	12.137
15	13 34 55.47	2.1353	15 18 36.4	12.069
16	13 37 3.75	2.1408	15 30 38.5	12.000
17	13 39 12.36	2.1463	15 42 36.4	11.930
18	13 41 21.31	2.1520	15 54 30.1	11.858
19	13 43 30.60	2.1577	16 6 19.4	11.784
20	13 45 40.23	2.1633	16 18 4.2	11.710
21	13 47 50.20	2.1691	16 29 14.6	11.635
22	13 50 0.52	2.1749	16 41 20.4	11.558
23	13 52 11.19	2.1808	16 52 51.5	11.478
24	13 54 22.21	2.1866	–17 4 17.8	–11.398

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	SEPTEMBER 29.					OCTOBER 1.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	13 54 22.21	2.1866	−17 4 17.8	−11.398	0	15 46 13.30	2.4677	−24 12 1.0	−5.893
1	13 56 33.58	2.1924	17 15 39.3	11.317	1	15 48 41.51	2.4726	24 17 50.2	5.746
2	13 58 45.30	2.1983	17 26 55.8	11.233	2	15 51 10.01	2.4775	24 23 30.6	5.598
3	14 0 57.37	2.2042	17 38 7.3	11.148	3	15 53 38.81	2.4824	24 29 2.0	5.449
4	14 3 9.80	2.2102	17 49 13.6	11.063	4	15 56 7.90	2.4872	24 34 24.5	5.299
5	14 5 22.59	2.2162	18 0 14.8	10.976	5	15 58 37.27	2.4918	24 39 37.9	5.148
6	14 7 35.74	2.2222	18 11 10.7	10.887	6	16 1 6.91	2.4963	24 44 42.2	4.996
7	14 9 49.25	2.2282	18 22 1.2	10.797	7	16 3 36.83	2.5008	24 49 37.3	4.843
8	14 12 3.12	2.2342	18 32 46.3	10.705	8	16 6 7.01	2.5052	24 54 23.2	4.687
9	14 14 17.35	2.2402	18 43 25.8	10.612	9	16 8 37.45	2.5095	24 58 59.7	4.531
10	14 16 31.94	2.2463	18 53 59.7	10.518	10	16 11 8.15	2.5138	25 3 26.9	4.375
11	14 18 46.90	2.2524	19 4 27.9	10.422	11	16 13 39.10	2.5179	25 7 44.7	4.218
12	14 21 2.23	2.2585	19 14 50.3	10.324	12	16 16 10.30	2.5219	25 11 53.1	4.060
13	14 23 17.92	2.2646	19 25 6.8	10.226	13	16 18 41.73	2.5258	25 15 51.9	3.901
14	14 25 33.98	2.2707	19 35 17.4	10.126	14	16 21 13.40	2.5297	25 19 41.2	3.741
15	14 27 50.40	2.2768	19 45 21.9	10.023	15	16 23 45.29	2.5333	25 23 20.8	3.579
16	14 30 7.19	2.2829	19 55 20.2	9.920	16	16 26 17.40	2.5370	25 26 50.7	3.418
17	14 32 24.35	2.2891	20 5 12.3	9.816	17	16 28 49.73	2.5405	25 30 10.9	3.256
18	14 34 41.88	2.2952	20 14 58.1	9.710	18	16 31 22.26	2.5438	25 33 21.4	3.093
19	14 36 59.77	2.3013	20 24 37.5	9.603	19	16 33 54.99	2.5472	25 36 22.0	2.928
20	14 39 18.03	2.3074	20 34 10.4	9.493	20	16 36 27.92	2.5503	25 39 12.7	2.763
21	14 41 36.66	2.3135	20 43 36.7	9.383	21	16 39 1.03	2.5533	25 41 53.6	2.598
22	14 43 55.65	2.3196	20 52 56.4	9.273	22	16 41 34.32	2.5563	25 44 24.5	2.432
23	14 46 15.01	2.3257	−21 2 9.4	− 9.159	23	16 44 7.79	2.5592	−25 46 45.4	−2.266
	SEPTEMBER 30.					OCTOBER 2.			
0	14 48 34.73	2.3318	−21 11 15.5	− 9.044	0	16 46 41.42	2.5618	−25 48 56.3	−2.098
1	14 50 54.82	2.3378	21 20 14.7	8.928	1	16 49 15.21	2.5644	25 50 57.2	1.930
2	14 53 15.27	2.3438	21 29 6.9	8.811	2	16 51 49.15	2.5668	25 52 47.9	1.761
3	14 55 36.08	2.3498	21 37 52.0	8.693	3	16 54 23.23	2.5691	25 54 28.5	1.593
4	14 57 57.25	2.3558	21 46 30.0	8.573	4	16 56 57.44	2.5713	25 55 59.0	1.423
5	15 0 18.78	2.3618	21 55 0.7	8.451	5	16 59 31.78	2.5734	25 57 19.2	1.253
6	15 2 40.67	2.3678	22 3 24.1	8.328	6	17 2 6.25	2.5754	25 58 29.3	1.083
7	15 5 2.92	2.3738	22 11 40.1	8.204	7	17 4 40.83	2.5772	25 59 29.1	0.912
8	15 7 25.52	2.3796	22 19 48.6	8.078	8	17 7 15.51	2.5788	26 0 18.7	0.741
9	15 9 48.47	2.3855	22 27 49.5	7.952	9	17 9 50.29	2.5804	26 0 58.0	0.569
10	15 12 11.78	2.3913	22 35 42.8	7.823	10	17 12 25.16	2.5819	26 1 27.0	0.397
11	15 14 35.43	2.3971	22 43 28.3	7.693	11	17 15 0.12	2.5833	26 1 45.6	0.224
12	15 16 59.43	2.4028	22 51 6.0	7.563	12	17 17 35.15	2.5843	26 1 53.9	−0.053
13	15 19 23.77	2.4085	22 58 35.8	7.430	13	17 20 10.24	2.5853	26 1 51.9	+0.120
14	15 21 48.45	2.4142	23 5 57.6	7.297	14	17 22 45.39	2.5863	26 1 39.5	0.293
15	15 24 13.47	2.4198	23 13 11.4	7.163	15	17 25 20.59	2.5871	26 1 16.7	0.466
16	15 26 38.82	2.4253	23 20 17.1	7.027	16	17 27 55.84	2.5878	26 0 43.6	0.638
17	15 29 4.51	2.4308	23 27 14.6	6.889	17	17 30 31.12	2.5882	26 0 0.1	0.812
18	15 31 30.52	2.4363	23 34 3.8	6.750	18	17 33 6.42	2.5885	25 59 6.2	0.986
19	15 33 56.86	2.4417	23 40 44.6	6.610	19	17 35 41.74	2.5888	25 58 1.8	1.159
20	15 36 23.52	2.4470	23 47 17.0	6.469	20	17 38 17.08	2.5890	25 56 47.1	1.332
21	15 38 50.50	2.4523	23 53 40.9	6.328	21	17 40 52.42	2.5889	25 55 22.0	1.505
22	15 41 17.79	2.4574	23 59 56.3	6.184	22	17 43 27.75	2.5888	25 53 46.5	1.678
23	15 43 45.39	2.4626	24 6 3.0	6.039	23	17 46 3.07	2.5885	25 52 0.6	1.851
24	15 46 13.30	2.4677	−24 12 1.0	− 5.893	24	17 48 38.37	2.5881	−25 50 4.4	+2.023

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	OCTOBER 3.			
	h m s	s	° ′ ″	″
0	17 48 38.37	2.5881	−25 50 4.4	+2.023
1	17 51 13.64	2.5875	25 47 57.8	2.197
2	17 53 48.87	2.5868	25 45 40.8	2.369
3	17 56 24.06	2.5861	25 43 13.5	2.542
4	17 58 59.20	2.5852	25 40 35.8	2.714
5	18 1 34.28	2.5841	25 37 47.8	2.885
6	18 4 9.29	2.5829	25 34 49.6	3.057
7	18 6 44.23	2.5817	25 31 41.0	3.228
8	18 9 19.09	2.5803	25 28 22.2	3.398
9	18 11 53.86	2.5788	25 24 53.2	3.568
10	18 14 28.54	2.5771	25 21 14.0	3.738
11	18 17 3.11	2.5753	25 17 24.6	3.908
12	18 19 37.57	2.5733	25 13 25.0	4.078
13	18 22 11.91	2.5713	25 9 15.3	4.246
14	18 24 46.13	2.5693	25 4 55.5	4.413
15	18 27 20.22	2.5670	25 0 25.7	4.580
16	18 29 54.17	2.5647	24 55 45.9	4.747
17	18 32 27.98	2.5623	24 50 56.1	4.913
18	18 35 1.64	2.5597	24 45 56.3	5.078
19	18 37 35.14	2.5570	24 40 46.7	5.243
20	18 40 8.48	2.5543	24 35 27.2	5.407
21	18 42 41.66	2.5515	24 29 57.9	5.569
22	18 45 14.66	2.5485	24 24 18.9	5.732
23	18 47 47.48	2.5454	−24 18 30.1	+5.893
	OCTOBER 4.			
0	18 50 20.11	2.5423	−24 12 31.7	+6.053
1	18 52 52.55	2.5391	24 6 23.7	6.213
2	18 55 24.80	2.5358	24 0 6.1	6.373
3	18 57 56.84	2.5323	23 53 39.0	6.531
4	19 0 28.68	2.5288	23 47 2.4	6.688
5	19 3 0.30	2.5253	23 40 16.4	6.844
6	19 5 31.71	2.5217	23 33 21.1	6.999
7	19 8 2.90	2.5179	23 26 16.5	7.153
8	19 10 33.86	2.5141	23 19 2.8	7.305
9	19 13 4.59	2.5103	23 11 39.9	7.458
10	19 15 35.09	2.5063	23 4 7.9	7.609
11	19 18 5.35	2.5023	22 56 26.8	7.759
12	19 20 35.36	2.4982	22 48 36.8	7.908
13	19 23 5.13	2.4941	22 40 37.9	8.055
14	19 25 34.65	2.4899	22 32 30.2	8.202
15	19 28 3.92	2.4857	22 24 13.7	8.348
16	19 30 32.93	2.4814	22 15 48.5	8.492
17	19 33 1.69	2.4771	22 7 14.7	8.635
18	19 35 30.18	2.4726	21 58 32.3	8.777
19	19 37 58.40	2.4682	21 49 41.5	8.917
20	19 40 26.36	2.4638	21 40 42.3	9.056
21	19 42 54.05	2.4593	21 31 34.8	9.194
22	19 45 21.47	2.4547	21 22 19.0	9.331
23	19 47 48.61	2.4500	21 12 55.1	9.466
24	19 50 15.47	2.4454	−21 3 23.1	+9.600

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	OCTOBER 5.			
	h m s	s	° ′ ″	″
0	19 50 15.47	2.4454	−21 3 23.1	+ 9.600
1	19 52 42.06	2.4408	20 53 43.1	9.733
2	19 55 8.36	2.4360	20 43 55.1	9.865
3	19 57 34.38	2.4313	20 33 59.3	9.995
4	20 0 0.12	2.4267	20 23 55.7	10.124
5	20 2 25.58	2.4219	20 13 44.4	10.252
6	20 4 50.75	2.4171	20 3 25.5	10.378
7	20 7 15.63	2.4123	19 52 59.1	10.503
8	20 9 40.23	2.4076	19 42 25.2	10.626
9	20 12 4.54	2.4027	19 31 44.0	10.748
10	20 14 28.55	2.3978	19 20 55.5	10.868
11	20 16 52.27	2.3930	19 9 59.9	10.987
12	20 19 15.71	2.3883	18 58 57.1	11.105
13	20 21 38.86	2.3834	18 47 47.3	11.221
14	20 24 1.72	2.3786	18 36 30.6	11.335
15	20 26 24.29	2.3737	18 25 7.1	11.448
16	20 28 46.56	2.3688	18 13 36.8	11.560
17	20 31 8.55	2.3641	18 1 59.9	11.670
18	20 33 30.25	2.3593	17 50 16.4	11.779
19	20 35 51.66	2.3544	17 38 26.4	11.887
20	20 38 12.78	2.3497	17 26 30.0	11.993
21	20 40 33.62	2.3449	17 14 27.3	12.097
22	20 42 54.17	2.3401	17 2 18.4	12.199
23	20 45 14.43	2.3353	−16 50 3.4	+12.300
	OCTOBER 6.			
0	20 47 34.41	2.3307	−16 37 42.4	+12.399
1	20 49 54.11	2.3260	16 25 15.5	12.498
2	20 52 13.53	2.3213	16 12 42.7	12.595
3	20 54 32.66	2.3166	16 0 4.1	12.690
4	20 56 51.52	2.3120	15 47 19.9	12.783
5	20 59 10.10	2.3074	15 34 30.1	12.876
6	21 1 28.41	2.3029	15 21 34.8	12.966
7	21 3 46.45	2.2984	15 8 34.2	13.054
8	21 6 4.22	2.2938	14 55 28.3	13.142
9	21 8 21.71	2.2893	14 42 17.2	13.228
10	21 10 38.94	2.2850	14 29 0.9	13.313
11	21 12 55.91	2.2806	14 15 39.7	13.395
12	21 15 12.61	2.2762	14 2 13.5	13.477
13	21 17 29.05	2.2719	13 48 42.5	13.556
14	21 19 45.24	2.2677	13 35 6.8	13.633
15	21 22 1.17	2.2634	13 21 26.5	13.709
16	21 24 16.85	2.2593	13 7 41.7	13.784
17	21 26 32.28	2.2552	12 53 52.4	13.858
18	21 28 47.47	2.2511	12 39 58.7	13.930
19	21 31 2.41	2.2470	12 26 0.8	13.999
20	21 33 17.11	2.2430	12 11 58.8	14.068
21	21 35 31.57	2.2391	11 57 52.7	14.135
22	21 37 45.80	2.2353	11 43 42.6	14.201
23	21 39 59.80	2.2313	11 29 28.6	14.265
24	21 42 13.56	2.2275	−11 15 10.8	+14.328

GREENWICH MEAN TIME.

OCTOBER 7.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	h m s	s	° ′ ″	″
0	21 42 13.56	2.2275	−11 15 10.8	+14.328
1	21 44 27.10	2.2238	11 0 49.3	14.388
2	21 46 40.42	2.2202	10 46 24.3	14.446
3	21 48 53.52	2.2166	10 31 55.8	14.503
4	21 51 6.41	2.2130	10 17 23.9	14.559
5	21 53 19.08	2.2094	10 2 48.7	14.614
6	21 55 31.54	2.2060	9 48 10.2	14.668
7	21 57 43.80	2.2027	9 33 28.6	14.718
8	21 59 55.86	2.1993	9 18 44.0	14.768
9	22 2 7.72	2.1960	9 3 56.5	14.816
10	22 4 19.38	2.1928	8 49 6.1	14.863
11	22 6 30.85	2.1897	8 34 13.0	14.907
12	22 8 42.14	2.1867	8 19 17.3	14.950
13	22 10 53.25	2.1836	8 4 19.0	14.993
14	22 13 4.17	2.1806	7 49 18.2	15.033
15	22 15 14.92	2.1777	7 34 15.1	15.071
16	22 17 25.49	2.1748	7 19 9.7	15.108
17	22 19 35.90	2.1721	7 4 2.1	15.143
18	22 21 46.14	2.1694	6 48 52.5	15.178
19	22 23 56.23	2.1668	6 33 40.8	15.211
20	22 26 6.15	2.1641	6 18 27.2	15.241
21	22 28 15.92	2.1617	6 3 11.9	15.270
22	22 30 25.55	2.1593	5 47 54.8	15.298
23	22 32 35.03	2.1568	− 5 32 36.1	+15.324

OCTOBER 8.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	h m s	s	° ′ ″	″
0	22 34 44.37	2.1545	− 5 17 15.9	+15.348
1	22 36 53.57	2.1523	5 1 54.3	15.372
2	22 39 2.64	2.1501	4 46 31.3	15.393
3	22 41 11.58	2.1480	4 31 7.1	15.413
4	22 43 20.40	2.1460	4 15 41.7	15.433
5	22 45 29.10	2.1440	4 0 15.2	15.450
6	22 47 37.68	2.1420	3 44 47.7	15.465
7	22 49 46.14	2.1402	3 29 19.4	15.478
8	22 51 54.50	2.1384	3 13 50.3	15.491
9	22 54 2.75	2.1367	2 58 20.5	15.503
10	22 56 10.90	2.1351	2 42 50.0	15.512
11	22 58 18.96	2.1335	2 27 19.1	15.519
12	23 0 26.92	2.1320	2 11 47.7	15.526
13	23 2 34.80	2.1306	1 56 16.0	15.530
14	23 4 42.59	2.1292	1 40 44.1	15.533
15	23 6 50.30	2.1278	1 25 12.0	15.536
16	23 8 57.93	2.1266	1 9 39.8	15.537
17	23 11 5.49	2.1254	0 54 7.6	15.535
18	23 13 12.98	2.1243	0 38 35.6	15.532
19	23 15 20.41	2.1233	0 23 3.8	15.528
20	23 17 27.78	2.1223	− 0 7 32.3	15.523
21	23 19 35.09	2.1214	+ 0 7 58.9	15.516
22	23 21 42.35	2.1206	0 23 29.6	15.507
23	23 23 49.56	2.1198	0 38 59.7	15.497
24	23 25 56.73	2.1191	+ 0 54 29.2	+15.485

OCTOBER 9.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	h m s	s	° ′ ″	″
0	23 25 56.73	2.1191	+ 0 54 29.2	[illegible]
1	23 28 3.85	2.1184	1 9 57.9	[illegible]
2	23 30 10.94	2.1179	1 25 25.8	[illegible]
3	23 32 18.00	2.1174	1 40 52.8	[illegible]
4	23 34 25.03	2.1169	1 56 18.8	[illegible]
5	23 36 32.03	2.1165	2 11 43.7	[illegible]
6	23 38 39.01	2.1162	2 27 7.5	[illegible]
7	23 40 45.97	2.1159	2 42 30.0	[illegible]
8	23 42 52.92	2.1158	2 57 51.1	[illegible]
9	23 44 59.86	2.1156	3 13 10.8	[illegible]
10	23 47 6.79	2.1155	3 28 28.9	[illegible]
11	23 49 13.72	2.1156	3 43 45.5	[illegible]
12	23 51 20.66	2.1157	3 59 0.4	[illegible]
13	23 53 27.60	2.1157	4 14 13.5	[illegible]
14	23 55 34.54	2.1158	4 29 24.7	[illegible]
15	23 57 41.50	2.1162	4 44 34.0	[illegible]
16	23 59 48.48	2.1164	4 59 41.3	[illegible]
17	0 1 55.47	2.1168	5 14 46.4	[illegible]
18	0 4 2.49	2.1173	5 29 49.4	[illegible]
19	0 6 9.54	2.1177	5 44 50.1	[illegible]
20	0 8 16.61	2.1182	5 59 48.4	[illegible]
21	0 10 23.72	2.1188	6 14 44.3	[illegible]
22	0 12 30.86	2.1193	6 29 37.6	[illegible]
23	0 14 38.04	2.1201	+ 6 44 28.3	[illegible]

OCTOBER 10.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	h m s	s	° ′ ″	″
0	0 16 45.27	2.1208	+ 6 59 16.4	+14.778
1	0 18 52.54	2.1216	7 14 1.7	14.732
2	0 20 59.86	2.1225	7 28 44.1	14.686
3	0 23 7.24	2.1234	7 43 23.6	14.633
4	0 25 14.67	2.1243	7 58 0.0	14.582
5	0 27 22.16	2.1253	8 12 33.4	14.530
6	0 29 29.71	2.1264	8 27 3.6	14.476
7	0 31 37.33	2.1275	8 41 30.5	14.421
8	0 33 45.01	2.1286	8 55 54.1	14.365
9	0 35 52.76	2.1298	9 10 14.3	14.308
10	0 38 0.59	2.1312	9 24 31.0	14.248
11	0 40 8.50	2.1324	9 38 44.1	14.188
12	0 42 16.48	2.1337	9 52 53.6	14.128
13	0 44 24.54	2.1351	10 6 59.4	14.064
14	0 46 32.69	2.1366	10 21 1.3	13.999
15	0 48 40.93	2.1380	10 34 59.3	13.934
16	0 50 49.25	2.1394	10 48 53.4	13.868
17	0 52 57.66	2.1410	11 2 43.5	13.801
18	0 55 6.17	2.1427	11 16 29.5	13.732
19	0 57 14.78	2.1443	11 30 11.3	13.661
20	0 59 23.49	2.1459	11 43 48.8	13.589
21	1 1 32.29	2.1476	11 57 22.0	13.517
22	1 3 41.20	2.1494	12 10 50.8	13.443
23	1 5 50.22	2.1512	12 24 15.1	13.366
24	1 7 59.34	2.1529	+12 37 34.9	+13.291

GREENWICH MEAN TIME.

Iour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
OCTOBER 11.				
	h m s	s	° ′ ″	″
0	1 7 59.34	2.1529	+12 37 34.9	+13.291
1	1 10 8.57	2.1548	12 50 50.0	13.213
2	1 12 17.91	2.1567	13 4 0.5	13.135
3	1 14 27.37	2.1586	13 17 6.2	13.055
4	1 16 36.94	2.1604	13 30 7.1	12.974
5	1 18 46.62	2.1623	13 43 3.1	12.892
6	1 20 56.42	2.1643	13 55 54.1	12.808
7	1 23 6.34	2.1664	14 8 40.0	12.723
8	1 25 16.39	2.1685	14 21 20.8	12.638
9	1 27 26.56	2.1705	14 33 56.5	12.551
10	1 29 36.85	2.1725	14 46 26.9	12.463
11	1 31 47.26	2.1746	14 58 52.0	12.373
12	1 33 57.80	2.1768	15 11 11.7	12.283
13	1 36 8.47	2.1789	15 23 26.0	12.193
14	1 38 19.27	2.1810	15 35 34.8	12.100
15	1 40 30.19	2.1832	15 47 38.0	12.006
16	1 42 41.25	2.1853	15 59 35.5	11.911
17	1 44 52.43	2.1875	16 11 27.3	11.816
18	1 47 3.75	2.1898	16 23 13.4	11.720
19	1 49 15.20	2.1920	16 34 53.7	11.622
20	1 51 26.79	2.1943	16 46 28.0	11.523
21	1 53 38.51	2.1964	16 57 56.4	11.423
22	1 55 50.36	2.1986	17 9 18.8	11.323
23	1 58 2.34	2.2008	+17 20 35.2	+11.222
OCTOBER 12.				
0	2 0 14.46	2.2032	+17 31 45.4	+11.118
1	2 2 26.72	2.2054	17 42 49.4	11.015
2	2 4 39.11	2.2076	17 53 47.2	10.911
3	2 6 51.63	2.2098	18 4 38.7	10.805
4	2 9 4.29	2.2121	18 15 23.8	10.698
5	2 11 17.08	2.2143	18 26 2.5	10.592
6	2 13 30.00	2.2165	18 36 34.8	10.483
7	2 15 43.06	2.2188	18 47 0.5	10.374
8	2 17 56.26	2.2210	18 57 19.7	10.264
9	2 20 9.58	2.2232	19 7 32.2	10.153
10	2 22 23.04	2.2254	19 17 38.1	10.042
11	2 24 36.63	2.2276	19 27 37.2	9.928
12	2 26 50.35	2.2298	19 37 29.5	9.815
13	2 29 4.20	2.2319	19 47 15.0	9.701
14	2 31 18.18	2.2341	19 56 53.6	9.586
15	2 33 32.29	2.2362	20 6 25.3	9.470
16	2 35 46.52	2.2383	20 15 50.0	9.353
17	2 38 0.88	2.2403	20 25 7.7	9.236
18	2 40 15.36	2.2423	20 34 18.3	9.118
19	2 42 29.96	2.2444	20 43 21.8	8.998
20	2 44 44.69	2.2464	20 52 18.1	8.879
21	2 46 59.53	2.2484	21 1 7.3	8.759
22	2 49 14.50	2.2504	21 9 49.2	8.638
23	2 51 29.58	2.2523	21 18 23.9	8.517
24	2 53 44.78	2.2543	+21 26 51.2	+ 8.394

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
OCTOBER 13.				
	h m s	s	° ′ ″	″
0	2 53 44.78	2.2543	+21 26 51.2	+8.394
1	2 56 0.09	2.2561	21 35 11.2	8.271
2	2 58 15.51	2.2579	21 43 23.7	8.147
3	3 0 31.04	2.2597	21 51 28.8	8.023
4	3 2 46.67	2.2614	21 59 26.4	7.898
5	3 5 2.41	2.2632	22 7 16.5	7.773
6	3 7 18.25	2.2648	22 14 59.1	7.646
7	3 9 34.19	2.2665	22 22 34.0	7.519
8	3 11 50.23	2.2681	22 30 1.4	7.393
9	3 14 6.36	2.2697	22 37 21.1	7.265
10	3 16 22.59	2.2713	22 44 33.2	7.137
11	3 18 38.91	2.2727	22 51 37.5	7.008
12	3 20 55.31	2.2741	22 58 34.1	6.879
13	3 23 11.80	2.2755	23 5 23.0	6.749
14	3 25 28.37	2.2768	23 12 4.0	6.618
15	3 27 45.01	2.2780	23 18 37.2	6.488
16	3 30 1.73	2.2793	23 25 2.5	6.357
17	3 32 18.52	2.2804	23 31 20.0	6.226
18	3 34 35.38	2.2816	23 37 29.6	6.094
19	3 36 52.31	2.2827	23 43 31.3	5.962
20	3 39 9.30	2.2836	23 49 25.0	5.828
21	3 41 26.34	2.2845	23 55 10.7	5.696
22	3 43 43.44	2.2855	24 0 48.5	5.563
23	3 46 0.60	2.2863	+24 6 18.3	+5.429
OCTOBER 14.				
0	3 48 17.80	2.2871	+24 11 40.0	+5.295
1	3 50 35.05	2.2878	24 16 53.7	5.162
2	3 52 52.34	2.2885	24 21 59.4	5.028
3	3 55 9.67	2.2891	24 26 57.0	4.893
4	3 57 27.03	2.2896	24 31 46.5	4.758
5	3 59 44.42	2.2901	24 36 27.9	4.623
6	4 2 1.84	2.2905	24 41 1.2	4.488
7	4 4 19.28	2.2908	24 45 26.4	4.353
8	4 6 36.74	2.2911	24 49 43.5	4.217
9	4 8 54.21	2.2913	24 53 52.4	4.081
10	4 11 11.70	2.2915	24 57 53.2	3.945
11	4 13 29.19	2.2916	25 1 45.8	3.809
12	4 15 46.69	2.2917	25 5 30.3	3.673
13	4 18 4.19	2.2916	25 9 6.6	3.538
14	4 20 21.68	2.2914	25 12 34.8	3.402
15	4 22 39.16	2.2912	25 15 54.8	3.265
16	4 24 56.62	2.2909	25 19 6.6	3.128
17	4 27 14.07	2.2907	25 22 10.2	2.993
18	4 29 31.50	2.2903	25 25 5.7	2.857
19	4 31 48.90	2.2898	25 27 53.0	2.720
20	4 34 6.27	2.2893	25 30 32.1	2.584
21	4 36 23.61	2.2887	25 33 3.1	2.448
22	4 38 40.91	2.2879	25 35 25.9	2.312
23	4 40 58.16	2.2872	25 37 40.5	2.176
24	4 43 15.37	2.2864	+25 39 47.0	+2.040

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
OCTOBER 15.					OCTOBER 17.				
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	4 43 15.37	2.2864	+25 39 47.0	+2.040	0	6 30 50.18	2.1747	+24 46 28.5	−4.098
1	4 45 32.53	2.2855	25 41 45.3	1.904	1	6 33 0.56	2.1712	24 42 19.1	4.214
2	4 47 49.63	2.2846	25 43 35.5	1.769	2	6 35 10.72	2.1676	24 38 2.8	4.329
3	4 50 6.68	2.2836	25 45 17.6	1.634	3	6 37 20.67	2.1641	24 33 39.6	4.443
4	4 52 23.66	2.2825	25 46 51.6	1.498	4	6 39 30.41	2.1605	24 29 9.6	4.557
5	4 54 40.58	2.2813	25 48 17.4	1.363	5	6 41 39.93	2.1568	24 24 32.8	4.670
6	4 56 57.42	2.2801	25 49 35.1	1.228	6	6 43 49.23	2.1533	24 19 49.2	4.782
7	4 59 14.19	2.2788	25 50 44.7	1.093	7	6 45 58.32	2.1497	24 14 58.9	4.894
8	5 1 30.88	2.2774	25 51 46.3	0.959	8	6 48 7.19	2.1460	24 10 1.9	5.005
9	5 3 47.48	2.2759	25 52 39.8	0.825	9	6 50 15.84	2.1423	24 4 58.3	5.115
10	5 6 3.99	2.2744	25 53 25.3	0.691	10	6 52 24.26	2.1385	23 59 48.1	5.225
11	5 8 20.41	2.2729	25 54 2.7	0.557	11	6 54 32.46	2.1348	23 54 31.3	5.334
12	5 10 36.74	2.2713	25 54 32.1	0.423	12	6 56 40.44	2.1311	23 49 8.0	5.442
13	5 12 52.97	2.2696	25 54 53.5	0.290	13	6 58 48.19	2.1273	23 43 38.2	5.550
14	5 15 9.09	2.2678	25 55 6.9	0.158	14	7 0 55.72	2.1236	23 38 2.0	5.657
15	5 17 25.10	2.2659	25 55 12.4	+0.025	15	7 3 3.02	2.1198	23 32 19.4	5.763
16	5 19 41.00	2.2641	25 55 9.9	−0.108	16	7 5 10.10	2.1161	23 26 30.5	5.868
17	5 21 56.79	2.2622	25 54 59.5	0.239	17	7 7 16.95	2.1123	23 20 35.3	5.973
18	5 24 12.46	2.2601	25 54 41.2	0.371	18	7 9 23.57	2.1084	23 14 33.7	6.078
19	5 26 28.00	2.2580	25 54 15.0	0.502	19	7 11 29.96	2.1047	23 8 25.9	6.181
20	5 28 43.42	2.2559	25 53 41.0	0.633	20	7 13 36.13	2.1008	23 2 12.0	6.283
21	5 30 58.71	2.2537	25 52 59.1	0.763	21	7 15 42.06	2.0970	22 55 51.9	6.386
22	5 33 13.86	2.2514	25 52 9.4	0.893	22	7 17 47.77	2.0933	22 49 25.7	6.488
23	5 35 28.88	2.2491	+25 51 11.9	−1.023	23	7 19 53.25	2.0893	+22 42 53.4	−6.589
OCTOBER 16.					OCTOBER 18.				
0	5 37 43.75	2.2467	+25 50 6.7	−1.152	0	7 21 58.49	2.0855	+22 36 15.1	−6.688
1	5 39 58.48	2.2443	25 48 53.7	1.281	1	7 24 3.51	2.0818	22 29 30.8	6.788
2	5 42 13.06	2.2418	25 47 33.0	1.408	2	7 26 8.30	2.0779	22 22 40.6	6.886
3	5 44 27.49	2.2392	25 46 4.7	1.536	3	7 28 12.86	2.0741	22 15 44.5	6.983
4	5 46 41.76	2.2366	25 44 28.7	1.664	4	7 30 17.19	2.0703	22 8 42.6	7.081
5	5 48 55.88	2.2339	25 42 45.0	1.791	5	7 32 21.29	2.0664	22 1 34.8	7.178
6	5 51 9.83	2.2312	25 40 53.8	1.917	6	7 34 25.16	2.0627	21 54 21.3	7.273
7	5 53 23.62	2.2284	25 38 55.0	2.043	7	7 36 28.81	2.0589	21 47 2.0	7.369
8	5 55 37.24	2.2256	25 36 48.7	2.168	8	7 38 32.23	2.0552	21 39 37.0	7.463
9	5 57 50.69	2.2228	25 34 34.8	2.293	9	7 40 35.43	2.0514	21 32 6.4	7.557
10	6 0 3.97	2.2198	25 32 13.5	2.418	10	7 42 38.40	2.0477	21 24 30.2	7.649
11	6 2 17.07	2.2168	25 29 44.7	2.542	11	7 44 41.15	2.0439	21 16 48.5	7.742
12	6 4 29.99	2.2138	25 27 8.5	2.665	12	7 46 43.67	2.0402	21 9 1.2	7.833
13	6 6 42.73	2.2108	25 24 24.9	2.788	13	7 48 45.97	2.0364	21 1 8.5	7.924
14	6 8 55.29	2.2078	25 21 34.0	2.909	14	7 50 48.04	2.0328	20 53 10.3	8.014
15	6 11 7.66	2.2046	25 18 35.8	3.031	15	7 52 49.90	2.0291	20 45 6.8	8.103
16	6 13 19.84	2.2014	25 15 30.3	3.152	16	7 54 51.53	2.0253	20 36 57.9	8.193
17	6 15 31.83	2.1982	25 12 17.6	3.273	17	7 56 52.94	2.0218	20 28 43.7	8.281
18	6 17 43.62	2.1949	25 8 57.6	3.393	18	7 58 54.14	2.0182	20 20 24.2	8.368
19	6 19 55.22	2.1917	25 5 30.5	3.512	19	8 0 55.12	2.0146	20 11 59.5	8.454
20	6 22 6.62	2.1883	25 1 56.2	3.631	20	8 2 55.89	2.0110	20 3 29.7	8.540
21	6 24 17.82	2.1849	24 58 14.8	3.748	21	8 4 56.44	2.0074	19 54 54.7	8.625
22	6 26 28.81	2.1815	24 54 26.4	3.866	22	8 6 56.78	2.0039	19 46 14.6	8.710
23	6 28 39.60	2.1781	24 50 30.9	3.983	23	8 8 56.91	2.0004	19 37 29.5	8.794
24	6 30 50.18	2.1747	+24 46 28.5	−4.098	24	8 10 56.83	1.9969	+19 28 39.3	−8.878

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	OCTOBER 19.			
	h m s	s	° ′ ″	″
0	8 10 56.83	1.9969	+19 28 39.3	-8.878
1	8 12 56.54	1.9935	19 19 44.2	8.960
2	8 14 56.05	1.9901	19 10 44.1	9.042
3	8 16 55.35	1.9867	19 1 39.2	9.123
4	8 18 54.45	1.9833	18 52 29.4	9.203
5	8 20 53.35	1.9800	18 43 14.8	9.283
6	8 22 52.05	1.9767	18 33 55.5	9.362
7	8 24 50.55	1.9734	18 24 31.4	9.441
8	8 26 48.86	1.9702	18 15 2.6	9.518
9	8 28 46.97	1.9669	18 5 29.2	9.595
10	8 30 44.89	1.9638	17 55 51.2	9.672
11	8 32 42.62	1.9607	17 46 8.6	9.747
12	8 34 40.17	1.9576	17 36 21.6	9.821
13	8 36 37.53	1.9545	17 26 30.1	9.896
14	8 38 34.71	1.9515	17 16 34.1	9.970
15	8 40 31.71	1.9485	17 6 33.7	10.043
16	8 42 28.53	1.9456	16 56 29.0	10.115
17	8 44 25.18	1.9428	16 46 19.9	10.187
18	8 46 21.66	1.9398	16 36 6.6	10.257
19	8 48 17.96	1.9369	16 25 49.1	10.328
20	8 50 14.09	1.9342	16 15 27.3	10.398
21	8 52 10.06	1.9315	16 5 1.4	10.466
22	8 54 5.87	1.9288	15 54 31.4	10.533
23	8 56 1.52	1.9262	+15 43 57.4	-10.601
	OCTOBER 20.			
0	8 57 57.01	1.9236	+15 33 19.3	-10.668
1	8 59 52.35	1.9210	15 22 37.2	10.734
2	9 1 47.53	1.9184	15 11 51.2	10.800
3	9 3 42.56	1.9160	15 1 1.2	10.865
4	9 5 37.45	1.9137	14 50 7.4	10.929
5	9 7 32.20	1.9113	14 39 9.7	10.993
6	9 9 26.80	1.9089	14 28 8.2	11.056
7	9 11 21.27	1.9067	14 17 3.0	11.118
8	9 13 15.60	1.9044	14 5 54.0	11.180
9	9 15 9.80	1.9023	13 54 41.4	11.240
10	9 17 3.87	1.9002	13 43 25.2	11.301
11	9 18 57.82	1.8981	13 32 5.3	11.361
12	9 20 51.64	1.8960	13 20 41.9	11.419
13	9 22 45.34	1.8941	13 9 15.0	11.478
14	9 24 38.93	1.8923	12 57 44.6	11.536
15	9 26 32.41	1.8903	12 46 10.7	11.593
16	9 28 25.77	1.8884	12 34 33.4	11.649
17	9 30 19.02	1.8867	12 22 52.8	11.704
18	9 32 12.17	1.8851	12 11 8.9	11.759
19	9 34 5.23	1.8834	11 59 21.7	11.813
20	9 35 58.18	1.8818	11 47 31.3	11.868
21	9 37 51.04	1.8803	11 35 37.6	11.922
22	9 39 43.81	1.8788	11 23 40.7	11.974
23	9 41 36.49	1.8773	11 11 40.7	12.025
24	9 43 29.09	1.8760	+10 59 37.7	-12.076

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	OCTOBER 21.			
	h m s	s	° ′ ″	″
0	9 43 29.09	1.8760	+10 59 37.7	-12.076
1	9 45 21.61	1.8747	10 47 31.6	12.127
2	9 47 14.05	1.8734	10 35 22.5	12.176
3	9 49 6.42	1.8722	10 23 10.5	12.225
4	9 50 58.71	1.8710	10 10 55.5	12.274
5	9 52 50.94	1.8700	9 58 37.6	12.322
6	9 54 43.11	1.8690	9 46 16.9	12.368
7	9 56 35.22	1.8680	9 33 53.4	12.415
8	9 58 27.27	1.8671	9 21 27.1	12.461
9	10 0 19.27	1.8663	9 8 58.1	12.506
10	10 2 11.23	1.8656	8 56 26.4	12.551
11	10 4 3.14	1.8648	8 43 52.0	12.594
12	10 5 55.00	1.8641	8 31 15.1	12.637
13	10 7 46.83	1.8635	8 18 35.6	12.679
14	10 9 38.62	1.8629	8 5 53.6	12.721
15	10 11 30.38	1.8625	7 53 9.1	12.762
16	10 13 22.12	1.8621	7 40 22.2	12.802
17	10 15 13.83	1.8617	7 27 32.9	12.842
18	10 17 5.52	1.8614	7 14 41.2	12.881
19	10 18 57.20	1.8613	7 1 47.2	12.918
20	10 20 48.87	1.8611	6 48 51.0	12.956
21	10 22 40.53	1.8609	6 35 52.5	12.993
22	10 24 32.18	1.8608	6 22 51.8	13.029
23	10 26 23.83	1.8609	+ 6 9 49.0	-13.064
	OCTOBER 22.			
0	10 28 15.49	1.8610	+ 5 56 44.1	-13.099
1	10 30 7.15	1.8612	5 43 37.1	13.133
2	10 31 58.83	1.8614	5 30 28.1	13.167
3	10 33 50.52	1.8617	5 17 17.1	13.199
4	10 35 42.23	1.8621	5 4 4.2	13.231
5	10 37 33.97	1.8625	4 50 49.4	13.262
6	10 39 25.73	1.8629	4 37 32.8	13.292
7	10 41 17.52	1.8634	4 24 14.4	13.322
8	10 43 9.34	1.8641	4 10 54.2	13.351
9	10 45 1.21	1.8648	3 57 32.3	13.378
10	10 46 53.12	1.8655	3 44 8.8	13.405
11	10 48 45.07	1.8663	3 30 43.7	13.432
12	10 50 37.07	1.8672	3 17 17.0	13.458
13	10 52 29.13	1.8682	3 3 48.8	13.483
14	10 54 21.25	1.8692	2 50 19.1	13.507
15	10 56 13.43	1.8702	2 36 48.0	13.530
16	10 58 5.67	1.8713	2 23 15.5	13.553
17	10 59 57.99	1.8726	2 9 41.7	13.574
18	11 1 50.38	1.8738	1 56 6.6	13.596
19	11 3 42.85	1.8753	1 42 30.2	13.616
20	11 5 35.41	1.8767	1 28 52.7	13.634
21	11 7 28.05	1.8782	1 15 14.1	13.653
22	11 9 20.79	1.8798	1 1 34.3	13.672
23	11 11 13.62	1.8813	0 47 53.5	13.688
24	11 13 6.55	1.8831	+ 0 34 11.7	-13.704

MOON, 1916.

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	OCTOBER 23.			
	h m s	s	° ′ ″	″
0	11 13 6.55	1.8831	+ 0 34 11.7	–13.704
1	11 14 59.59	1.8848	0 20 29.0	13.719
2	11 16 52.73	1.8866	+ 0 6 45.4	13.733
3	11 18 45.98	1.8885	– 0 6 59.0	13.747
4	11 20 39.35	1.8905	0 20 44.2	13.760
5	11 22 32.84	1.8925	0 34 30.2	13.772
6	11 24 26.45	1.8946	0 48 16.8	13.782
7	11 26 20.19	1.8968	1 2 4.0	13.792
8	11 28 14.07	1.8991	1 15 51.8	13.801
9	11 30 8.08	1.9014	1 29 40.1	13.809
10	11 32 2.24	1.9038	1 43 28.9	13.817
11	11 33 56.54	1.9063	1 57 18.1	13.823
12	11 35 50.99	1.9088	2 11 7.6	13.828
13	11 37 45.60	1.9114	2 24 57.4	13.833
14	11 39 40.36	1.9140	2 38 47.5	13.836
15	11 41 35.28	1.9168	2 52 37.7	13.838
16	11 43 30.37	1.9196	3 6 28.0	13.839
17	11 45 25.63	1.9225	3 20 18.4	13.840
18	11 47 21.07	1.9255	3 34 8.8	13.839
19	11 49 16.69	1.9285	3 47 59.1	13.838
20	11 51 12.49	1.9315	4 1 49.3	13.835
21	11 53 8.47	1.9347	4 15 39.3	13.832
22	11 55 4.65	1.9380	4 29 29.1	13.828
23	11 57 1.03	1.9413	– 4 43 18.6	–13.822
	OCTOBER 24.			
0	11 58 57.60	1.9446	– 4 57 7.7	–13.815
1	12 0 54.38	1.9481	5 10 56.4	13.808
2	12 2 51.37	1.9516	5 24 44.6	13.798
3	12 4 48.57	1.9551	5 38 32.2	13.788
4	12 6 45.98	1.9588	5 52 19.2	13.778
5	12 8 43.62	1.9625	6 6 5.5	13.766
6	12 10 41.48	1.9663	6 19 51.1	13.753
7	12 12 39.57	1.9702	6 33 35.8	13.738
8	12 14 37.90	1.9741	6 47 19.7	13.723
9	12 16 36.46	1.9780	7 1 2.6	13.707
10	12 18 35.26	1.9821	7 14 44.5	13.689
11	12 20 34.31	1.9863	7 28 25.3	13.670
12	12 22 33.61	1.9904	7 42 4.9	13.650
13	12 24 33.16	1.9947	7 55 43.3	13.628
14	12 26 32.97	1.9990	8 9 20.3	13.606
15	12 28 33.04	2.0034	8 22 56.0	13.583
16	12 30 33.38	2.0079	8 36 30.3	13.558
17	12 32 33.99	2.0124	8 50 3.0	13.532
18	12 34 34.87	2.0169	9 3 34.1	13.504
19	12 36 36.02	2.0216	9 17 3.5	13.476
20	12 38 37.46	2.0263	9 30 31.2	13.447
21	12 40 39.18	2.0311	9 43 57.1	13.416
22	12 42 41.19	2.0360	9 57 21.1	13.383
23	12 44 43.50	2.0409	10 10 43.1	13.350
24	12 46 46.10	2.0458	–10 24 3.1	–13.315

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	OCTOBER 25.			
	h m s	s	° ′ ″	″
0	12 46 46.10	2.0458	–10 24 3.1	–13.31
1	12 48 49.00	2.0509	10 37 20.9	13.27
2	12 50 52.21	2.0560	10 50 36.5	13.24
3	12 52 55.72	2.0612	11 3 49.9	13.20
4	12 54 59.55	2.0664	11 17 0.8	13.16
5	12 57 3.69	2.0717	11 30 9.3	13.12
6	12 59 8.15	2.0770	11 43 15.3	13.07
7	13 1 12.93	2.0823	11 56 18.7	13.03
8	13 3 18.03	2.0878	12 9 19.4	12.98
9	13 5 23.46	2.0933	12 22 17.3	12.94
10	13 7 29.23	2.0989	12 35 12.4	12.89
11	13 9 35.33	2.1045	12 48 4.5	12.84
12	13 11 41.77	2.1102	13 0 53.6	12.79
13	13 13 48.55	2.1159	13 13 39.6	12.73
14	13 15 55.68	2.1217	13 26 22.3	12.68
15	13 18 3.15	2.1275	13 39 1.8	12.63
16	13 20 10.98	2.1334	13 51 37.9	12.57
17	13 22 19.16	2.1393	14 4 10.6	12.51
18	13 24 27.69	2.1453	14 16 39.7	12.45
19	13 26 36.59	2.1513	14 29 5.1	12.39
20	13 28 45.85	2.1573	14 41 26.8	12.33
21	13 30 55.47	2.1634	14 53 44.7	12.26
22	13 33 5.46	2.1696	15 5 58.7	12.20
23	13 35 15.82	2.1758	–15 18 8.7	–12.13
	OCTOBER 26.			
0	13 37 26.55	2.1820	–15 30 14.6	–12.06
1	13 39 37.66	2.1883	15 42 16.3	11.99
2	13 41 49.14	2.1946	15 54 13.7	11.92
3	13 44 1.01	2.2009	16 6 6.8	11.84
4	13 46 13.25	2.2073	16 17 55.4	11.77
5	13 48 25.88	2.2138	16 29 39.5	11.69
6	13 50 38.90	2.2202	16 41 18.9	11.61
7	13 52 52.30	2.2266	16 52 53.6	11.53
8	13 55 6.09	2.2331	17 4 23.4	11.45
9	13 57 20.27	2.2396	17 15 48.2	11.37
10	13 59 34.84	2.2461	17 27 8.1	11.28
11	14 1 49.80	2.2527	17 38 22.9	11.20
12	14 4 5.16	2.2593	17 49 32.4	11.11
13	14 6 20.91	2.2658	18 0 36.6	11.02
14	14 8 37.06	2.2725	18 11 35.4	10.934
15	14 10 53.61	2.2792	18 22 28.7	10.84
16	14 13 10.56	2.2858	18 33 16.4	10.74
17	14 15 27.90	2.2923	18 43 58.5	10.65
18	14 17 45.64	2.2990	18 54 34.7	10.554
19	14 20 3.78	2.3057	19 5 5.0	10.45
20	14 22 22.32	2.3123	19 15 29.3	10.35
21	14 24 41.26	2.3190	19 25 47.6	10.25
22	14 27 0.60	2.3257	19 35 59.7	10.14
23	14 29 20.34	2.3323	19 46 5.5	10.04
24	14 31 40.48	2.3390	–19 56 4.9	– 9.937

GREENWICH MEAN TIME.

our.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	OCTOBER 27.					OCTOBER 29.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	14 31 40.48	2.3390	−19 56 4.9	−9.937	0	16 30 50.41	2.5974	−25 21 4.8	−3.095
1	14 34 1.02	2.3457	20 5 57.9	9.828	1	16 33 26.35	2.6004	25 24 5.4	2.924
2	14 36 21.96	2.3523	20 15 44.3	9.718	2	16 36 2.46	2.6033	25 26 55.7	2.753
3	14 38 43.29	2.3588	20 25 24.0	9.605	3	16 38 38.74	2.6059	25 29 35.8	2.582
4	14 41 5.02	2.3655	20 34 56.9	9.492	4	16 41 15.17	2.6085	25 32 5.5	2.408
5	14 43 27.15	2.3721	20 44 23.0	9.378	5	16 43 51.76	2.6110	25 34 24.8	2.236
6	14 45 49.67	2.3786	20 53 42.2	9.261	6	16 46 28.49	2.6133	25 36 33.8	2.063
7	14 48 12.58	2.3852	21 2 54.3	9.143	7	16 49 5.35	2.6154	25 38 32.3	1.888
8	14 50 35.89	2.3917	21 11 59.3	9.023	8	16 51 42.34	2.6174	25 40 20.3	1.713
9	14 52 59.58	2.3981	21 20 57.0	8.901	9	16 54 19.44	2.6193	25 41 57.8	1.538
10	14 55 23.66	2.4046	21 29 47.4	8.778	10	16 56 56.65	2.6210	25 43 24.8	1.363
11	14 57 48.13	2.4110	21 38 30.4	8.654	11	16 59 33.96	2.6226	25 44 41.3	1.187
12	15 0 12.98	2.4174	21 47 5.9	8.528	12	17 2 11.36	2.6240	25 45 47.2	1.010
13	15 2 38.22	2.4238	21 55 33.7	8.400	13	17 4 48.84	2.6253	25 46 42.5	0.833
14	15 5 3.83	2.4300	22 3 53.9	8.272	14	17 7 26.39	2.6263	25 47 27.2	0.657
15	15 7 29.82	2.4363	22 12 6.3	8.141	15	17 10 4.00	2.6273	25 48 1.3	0.479
16	15 9 56.18	2.4424	22 20 10.8	8.009	16	17 12 41.66	2.6281	25 48 24.7	0.302
17	15 12 22.91	2.4486	22 28 7.4	7.876	17	17 15 19.37	2.6288	25 48 37.5	−0.124
18	15 14 50.01	2.4547	22 35 55.9	7.740	18	17 17 57.11	2.6293	25 48 39.6	+0.053
19	15 17 17.47	2.4607	22 43 36.2	7.603	19	17 20 34.88	2.6297	25 48 31.1	0.231
20	15 19 45.29	2.4667	22 51 8.3	7.466	20	17 23 12.67	2.6298	25 48 11.9	0.408
21	15 22 13.47	2.4726	22 58 32.1	7.327	21	17 25 50.46	2.6299	25 47 42.1	0.586
22	15 24 42.00	2.4783	23 5 47.5	7.186	22	17 28 28.26	2.6298	25 47 1.6	0.764
23	15 27 10.87	2.4841	−23 12 54.4	−7.043	23	17 31 6.04	2.6296	−25 46 10.4	+0.942
	OCTOBER 28.					OCTOBER 30.			
0	15 29 40.09	2.4898	−23 19 52.7	−6.900	0	17 33 43.81	2.6292	−25 45 8.6	+1.119
1	15 32 9.65	2.4955	23 26 42.4	6.755	1	17 36 21.54	2.6286	25 43 56.1	1.297
2	15 34 39.55	2.5010	23 33 23.3	6.608	2	17 38 59.24	2.6279	25 42 33.0	1.474
3	15 37 9.77	2.5064	23 39 55.4	6.461	3	17 41 36.89	2.6271	25 40 59.2	1.652
4	15 39 40.32	2.5118	23 46 18.6	6.312	4	17 44 14.49	2.6261	25 39 14.8	1.828
5	15 42 11.19	2.5171	23 52 32.8	6.162	5	17 46 52.02	2.6248	25 37 19.8	2.004
6	15 44 42.37	2.5223	23 58 38.0	6.011	6	17 49 29.47	2.6236	25 35 14.3	2.180
7	15 47 13.86	2.5274	24 4 34.1	5.858	7	17 52 6.85	2.6223	25 32 58.2	2.356
8	15 49 45.66	2.5324	24 10 21.0	5.704	8	17 54 44.14	2.6207	25 30 31.6	2.532
9	15 52 17.75	2.5373	24 15 58.6	5.548	9	17 57 21.33	2.6189	25 27 54.4	2.708
10	15 54 50.14	2.5422	24 21 26.8	5.392	10	17 59 58.41	2.6171	25 25 6.7	2.882
11	15 57 22.81	2.5468	24 26 45.6	5.235	11	18 2 35.38	2.6151	25 22 8.6	3.055
12	15 59 55.75	2.5513	24 31 55.0	5.077	12	18 5 12.22	2.6129	25 19 0.1	3.228
13	16 2 28.97	2.5559	24 36 54.8	4.917	13	18 7 48.93	2.6107	25 15 41.2	3.402
14	16 5 2.46	2.5603	24 41 45.0	4.756	14	18 10 25.50	2.6083	25 12 11.9	3.574
15	16 7 36.21	2.5646	24 46 25.5	4.593	15	18 13 1.92	2.6058	25 8 32.3	3.746
16	16 10 10.21	2.5688	24 50 56.2	4.431	16	18 15 38.19	2.6032	25 4 42.4	3.917
17	16 12 44.46	2.5728	24 55 17.2	4.268	17	18 18 14.30	2.6003	25 0 42.3	4.087
18	16 15 18.94	2.5766	24 59 28.3	4.103	18	18 20 50.23	2.5974	24 56 32.0	4.256
19	16 17 53.65	2.5804	25 3 29.5	3.937	19	18 23 25.99	2.5944	24 52 11.6	4.425
20	16 20 28.59	2.5841	25 7 20.7	3.770	20	18 26 1.56	2.5913	24 47 41.0	4.593
21	16 23 3.74	2.5876	25 11 1.9	3.603	21	18 28 36.94	2.5882	24 43 0.4	4.760
22	16 25 39.10	2.5910	25 14 33.0	3.434	22	18 31 12.13	2.5848	24 38 9.8	4.926
23	16 28 14.66	2.5943	25 17 54.0	3.265	23	18 33 47.11	2.5812	24 33 9.3	5.092
24	16 30 50.41	2.5974	−25 21 4.8	−3.095	24	18 36 21.87	2.5775	−24 27 58.8	+5.257

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	OCTOBER 31.					NOVEMBER 2.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	18 36 21.87	2.5775	−24 27 58.8	+ 5.257	0	20 34 32.83	2.3321	−17 28 39.2	+11.690
1	18 38 56.41	2.5738	24 22 38.5	5.420	1	20 36 52.59	2.3265	17 16 54.8	11.788
2	18 41 30.73	2.5701	24 17 8.4	5.583	2	20 39 12.01	2.3210	17 5 4.6	11.885
3	18 44 4.82	2.5662	24 11 28.6	5.743	3	20 41 31.11	2.3157	16 53 8.6	11.981
4	18 46 38.67	2.5622	24 5 39.2	5.904	4	20 43 49.89	2.3103	16 41 6.9	12.075
5	18 49 12.28	2.5581	23 59 40.1	6.064	5	20 46 8.34	2.3048	16 28 59.6	12.168
6	18 51 45.64	2.5538	23 53 31.5	6.223	6	20 48 26.47	2.2995	16 16 46.8	12.258
7	18 54 18.74	2.5495	23 47 13.4	6.380	7	20 50 44.28	2.2942	16 4 28.6	12.348
8	18 56 51.58	2.5452	23 40 45.9	6.536	8	20 53 1.77	2.2888	15 52 5.0	12.437
9	18 59 24.16	2.5408	23 34 9.1	6.691	9	20 55 18.94	2.2836	15 39 36.2	12.523
10	19 1 56.47	2.5362	23 27 23.0	6.845	10	20 57 35.80	2.2784	15 27 2.3	12.608
11	19 4 28.50	2.5316	23 20 27.7	6.998	11	20 59 52.35	2.2733	15 14 23.3	12.691
12	19 7 0.26	2.5269	23 13 23.2	7.150	12	21 2 8.59	2.2682	15 1 39.4	12.773
13	19 9 31.73	2.5221	23 6 9.7	7.300	13	21 4 24.53	2.2631	14 48 50.6	12.853
14	19 12 2.91	2.5173	22 58 47.2	7.449	14	21 6 40.16	2.2580	14 35 57.1	12.931
15	19 14 33.80	2.5124	22 51 15.8	7.597	15	21 8 55.49	2.2530	14 22 58.9	13.008
16	19 17 4.40	2.5075	22 43 35.6	7.743	16	21 11 10.52	2.2481	14 9 56.1	13.084
17	19 19 34.70	2.5024	22 35 46.6	7.888	17	21 13 25.26	2.2432	13 56 48.8	13.158
18	19 22 4.69	2.4973	22 27 49.0	8.033	18	21 15 39.70	2.2383	13 43 37.1	13.232
19	19 24 34.37	2.4922	22 19 42.7	8.176	19	21 17 53.86	2.2337	13 30 21.0	13.303
20	19 27 3.75	2.4870	22 11 27.9	8.317	20	21 20 7.74	2.2289	13 17 0.7	13.373
21	19 29 32.81	2.4818	22 3 4.7	8.457	21	21 22 21.33	2.2242	13 3 36.3	13.441
22	19 32 1.56	2.4765	21 54 33.1	8.596	22	21 24 34.64	2.2196	12 50 7.8	13.508
23	19 34 29.99	2.4711	−21 45 53.2	+ 8.733	23	21 26 47.68	2.2150	−12 36 35.4	+13.573
	NOVEMBER 1.					NOVEMBER 3.			
0	19 36 58.09	2.4657	−21 37 5.1	+ 8.869	0	21 29 0.44	2.2105	−12 22 59.1	+13.637
1	19 39 25.87	2.4603	21 28 8.9	9.003	1	21 31 12.94	2.2061	12 9 19.0	13.698
2	19 41 53.32	2.4548	21 19 4.7	9.136	2	21 33 25.17	2.2017	11 55 35.3	13.759
3	19 44 20.45	2.4494	21 9 52.6	9.268	3	21 35 37.14	2.1973	11 41 47.9	13.819
4	19 46 47.25	2.4439	21 0 32.6	9.398	4	21 37 48.85	2.1931	11 27 57.0	13.877
5	19 49 13.72	2.4384	20 51 4.8	9.528	5	21 40 0.31	2.1889	11 14 2.7	13.933
6	19 51 39.86	2.4328	20 41 29.3	9.654	6	21 42 11.52	2.1848	11 0 5.0	13.989
7	19 54 5.66	2.4273	20 31 46.3	9.780	7	21 44 22.48	2.1807	10 46 4.0	14.043
8	19 56 31.13	2.4218	20 21 55.7	9.905	8	21 46 33.20	2.1767	10 31 59.9	14.094
9	19 58 56.27	2.4162	20 11 57.7	10.028	9	21 48 43.68	2.1727	10 17 52.7	14.144
10	20 1 21.07	2.4105	20 1 52.4	10.148	10	21 50 53.92	2.1688	10 3 42.6	14.193
11	20 3 45.53	2.4048	19 51 39.9	10.268	11	21 53 3.94	2.1651	9 49 29.5	14.242
12	20 6 9.65	2.3992	19 41 20.2	10.387	12	21 55 13.73	2.1613	9 35 13.6	14.288
13	20 8 33.43	2.3936	19 30 53.5	10.503	13	21 57 23.30	2.1577	9 20 55.0	14.333
14	20 10 56.88	2.3880	19 20 19.8	10.619	14	21 59 32.65	2.1541	9 6 33.7	14.376
15	20 13 19.99	2.3823	19 9 39.2	10.733	15	22 1 41.79	2.1506	8 52 9.9	14.418
16	20 15 42.76	2.3767	18 58 51.8	10.846	16	22 3 50.72	2.1471	8 37 43.5	14.459
17	20 18 5.19	2.3711	18 47 57.7	10.957	17	22 5 59.44	2.1437	8 23 14.8	14.498
18	20 20 27.29	2.3655	18 36 57.0	11.066	18	22 8 7.96	2.1403	8 8 43.8	14.536
19	20 22 49.05	2.3598	18 25 49.8	11.173	19	22 10 16.28	2.1371	7 54 10.5	14.573
20	20 25 10.47	2.3543	18 14 36.2	11.280	20	22 12 24.41	2.1339	7 39 35.1	14.608
21	20 27 31.56	2.3488	18 3 16.2	11.385	21	22 14 32.35	2.1308	7 24 57.6	14.642
22	20 29 52.32	2.3432	17 51 50.0	11.488	22	22 16 40.11	2.1278	7 10 18.1	14.674
23	*20 32 12.74*	2.3376	17 40 17.6	11.590	23	22 18 47.68	2.1248	6 55 36.7	14.705
24	*20 34 32.83*	*2.3321*	−17 28 39.2	+11.690	24	22 20 55.08	2.1219	− 6 40 53.5	+14.734

GREENWICH MEAN TIME.

ur.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	NOVEMBER 4.			
	h m s	s	° ′ ″	″
0	22 20 55.08	2.1219	−6 40 53.5	+14.734
1	22 23 2.31	2.1191	6 26 8.6	14.763
2	22 25 9.37	2.1163	6 11 22.0	14.789
3	22 27 16.27	2.1137	5 56 33.9	14.814
4	22 29 23.01	2.1111	5 41 44.3	14.839
5	22 31 29.60	2.1086	5 26 53.2	14.862
6	22 33 36.04	2.1062	5 12 0.9	14.883
7	22 35 42.34	2.1038	4 57 7.3	14.903
8	22 37 48.49	2.1014	4 42 12.6	14.921
9	22 39 54.51	2.0993	4 27 16.8	14.938
10	22 42 0.40	2.0972	4 12 20.0	14.955
11	22 44 6.17	2.0951	3 57 22.2	14.970
12	22 46 11.81	2.0930	3 42 23.6	14.983
13	22 48 17.33	2.0911	3 27 24.2	14.995
14	22 50 22.74	2.0893	3 12 24.2	15.005
15	22 52 28.04	2.0875	2 57 23.6	15.014
16	22 54 33.24	2.0858	2 42 22.5	15.023
17	22 56 38.34	2.0843	2 27 20.9	15.030
18	22 58 43.35	2.0827	2 12 18.9	15.036
19	23 0 48.26	2.0811	1 57 16.6	15.039
20	23 2 53.08	2.0798	1 42 14.2	15.042
21	23 4 57.83	2.0785	1 27 11.6	15.044
22	23 7 2.50	2.0772	1 12 8.9	15.044
23	23 9 7.09	2.0760	−0 57 6.3	+15.043
	NOVEMBER 5.			
0	23 11 11.62	2.0749	−0 42 3.7	+15.042
1	23 13 16.08	2.0739	0 27 1.3	15.038
2	23 15 20.49	2.0730	−0 11 59.2	15.032
3	23 17 24.84	2.0721	+0 3 2.5	15.026
4	23 19 29.14	2.0713	0 18 3.9	15.018
5	23 21 33.39	2.0705	0 33 4.7	15.009
6	23 23 37.60	2.0698	0 48 5.0	15.000
7	23 25 41.77	2.0693	1 3 4.7	14.989
8	23 27 45.91	2.0687	1 18 3.7	14.977
9	23 29 50.01	2.0682	1 33 1.9	14.963
10	23 31 54.09	2.0678	1 47 59.2	14.948
11	23 33 58.15	2.0676	2 2 55.6	14.931
12	23 36 2.20	2.0673	2 17 50.9	14.913
13	23 38 6.23	2.0672	2 32 45.2	14.895
14	23 40 10.26	2.0671	2 47 38.3	14.874
15	23 42 14.28	2.0670	3 2 30.1	14.853
16	23 44 18.30	2.0671	3 17 20.7	14.831
17	23 46 22.33	2.0673	3 32 9.8	14.807
18	23 48 26.37	2.0674	3 46 57.5	14.783
19	23 50 30.42	2.0676	4 1 43.7	14.756
20	23 52 34.48	2.0679	4 16 28.2	14.728
21	23 54 38.57	2.0683	4 31 11.0	14.699
22	23 56 42.68	2.0688	4 45 52.1	14.670
23	23 58 46.82	2.0693	5 0 31.4	14.638
24	*0 0 50.99*	*2.0698*	*+5 15 8.7*	*+14.605*

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	NOVEMBER 6.			
	h m s	s	° ′ ″	″
0	0 0 50.99	2.0698	+ 5 15 8.7	+14.605
1	0 2 55.20	2.0705	5 29 44.0	14.572
2	0 4 59.45	2.0712	5 44 17.3	14.538
3	0 7 3.74	2.0719	5 58 48.5	14.501
4	0 9 8.08	2.0728	6 13 17.4	14.463
5	0 11 12.47	2.0736	6 27 44.1	14.425
6	0 13 16.91	2.0745	6 42 8.4	14.385
7	0 15 21.41	2.0756	6 56 30.3	14.344
8	0 17 25.98	2.0767	7 10 49.7	14.302
9	0 19 30.61	2.0778	7 25 6.5	14.258
10	0 21 35.31	2.0790	7 39 20.7	14.213
11	0 23 40.09	2.0803	7 53 32.1	14.168
12	0 25 44.94	2.0815	8 7 40.8	14.121
13	0 27 49.87	2.0828	8 21 46.6	14.073
14	0 29 54.88	2.0843	8 35 49.5	14.023
15	0 31 59.98	2.0858	8 49 49.4	13.973
16	0 34 5.17	2.0873	9 3 46.2	13.920
17	0 36 10.45	2.0888	9 17 39.8	13.867
18	0 38 15.82	2.0903	9 31 30.2	13.813
19	0 40 21.29	2.0921	9 45 17.3	13.758
20	0 42 26.87	2.0938	9 59 1.1	13.702
21	0 44 32.55	2.0956	10 12 41.5	13.643
22	0 46 38.34	2.0973	10 26 18.3	13.584
23	0 48 44.23	2.0992	+10 39 51.6	+13.524
	NOVEMBER 7.			
0	0 50 50.24	2.1012	+10 53 21.2	+13.463
1	0 52 56.37	2.1031	11 6 47.1	13.400
2	0 55 2.61	2.1050	11 20 9.2	13.337
3	0 57 8.97	2.1071	11 33 27.5	13.272
4	0 59 15.46	2.1093	11 46 41.8	13.205
5	1 1 22.08	2.1114	11 59 52.1	13.138
6	1 3 28.83	2.1136	12 12 58.4	13.070
7	1 5 35.71	2.1158	12 26 0.5	13.000
8	1 7 42.72	2.1179	12 38 58.4	12.930
9	1 9 49.86	2.1203	12 51 52.1	12.858
10	1 11 57.15	2.1226	13 4 41.4	12.785
11	1 14 4.57	2.1248	13 17 26.3	12.712
12	1 16 12.13	2.1273	13 30 6.8	12.637
13	1 18 19.84	2.1297	13 42 42.7	12.560
14	1 20 27.69	2.1321	13 55 14.0	12.483
15	1 22 35.69	2.1347	14 7 40.6	12.403
16	1 24 43.85	2.1372	14 20 2.4	12.324
17	1 26 52.15	2.1396	14 32 19.5	12.243
18	1 29 0.60	2.1422	14 44 31.6	12.161
19	1 31 9.21	2.1448	14 56 38.8	12.079
20	1 33 17.97	2.1473	15 8 41.1	11.995
21	1 35 26.89	2.1500	15 20 38.2	11.909
22	1 37 35.97	2.1527	15 32 30.2	11.823
23	1 39 45.21	2.1553	15 44 17.0	11.736
24	1 41 54.61	2.1580	+15 55 58.5	+11.648

GREENWICH MEAN TIME.

NOVEMBER 8.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	h m s	s	° ′ ″	″
0	1 41 54.61	2.1580	+15 55 58.5	+11.648
1	1 44 4.17	2.1607	16 7 34.7	11.558
2	1 46 13.89	2.1634	16 19 5.5	11.468
3	1 48 23.78	2.1662	16 30 30.8	11.376
4	1 50 33.83	2.1688	16 41 50.6	11.283
5	1 52 44.04	2.1716	16 53 4.8	11.190
6	1 54 54.42	2.1744	17 4 13.4	11.096
7	1 57 4.97	2.1772	17 15 16.3	11.000
8	1 59 15.68	2.1799	17 26 13.4	10.903
9	2 1 26.56	2.1827	17 37 4.6	10.805
10	2 3 37.60	2.1854	17 47 50.0	10.707
11	2 5 48.81	2.1883	17 58 29.4	10.607
12	2 8 0.19	2.1911	18 9 2.8	10.507
13	2 10 11.74	2.1938	18 19 30.2	10.405
14	2 12 23.45	2.1966	18 29 51.4	10.302
15	2 14 35.33	2.1993	18 40 6.4	10.198
16	2 16 47.37	2.2021	18 50 15.2	10.094
17	2 18 59.58	2.2049	19 0 17.7	9.988
18	2 21 11.96	2.2077	19 10 13.8	9.882
19	2 23 24.50	2.2104	19 20 3.5	9.774
20	2 25 37.21	2.2132	19 29 46.7	9.666
21	2 27 50.08	2.2158	19 39 23.4	9.558
22	2 30 3.11	2.2185	19 48 53.6	9.448
23	2 32 16.30	2.2213	+19 58 17.1	+ 9.336

NOVEMBER 9.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
0	2 34 29.66	2.2240	+20 7 33.9	+ 9.224
1	2 36 43.18	2.2266	20 16 44.0	9.112
2	2 38 56.85	2.2292	20 25 47.3	8.998
3	2 41 10.68	2.2318	20 34 43.8	8.884
4	2 43 24.66	2.2343	20 43 33.4	8.768
5	2 45 38.79	2.2368	20 52 16.0	8.653
6	2 47 53.08	2.2394	21 0 51.7	8.537
7	2 50 7.52	2.2419	21 9 20.4	8.419
8	2 52 22.11	2.2443	21 17 42.0	8.301
9	2 54 36.84	2.2468	21 25 56.5	8.182
10	2 56 51.72	2.2492	21 34 3.8	8.062
11	2 59 6.74	2.2515	21 42 3.9	7.942
12	3 1 21.90	2.2538	21 49 56.8	7.821
13	3 3 37.20	2.2561	21 57 42.4	7.698
14	3 5 52.63	2.2583	22 5 20.6	7.576
15	3 8 8.20	2.2606	22 12 51.5	7.453
16	3 10 23.90	2.2627	22 20 15.0	7.329
17	3 12 39.72	2.2648	22 27 31.0	7.204
18	3 14 55.67	2.2668	22 34 39.5	7.079
19	3 17 11.74	2.2688	22 41 40.5	6.953
20	3 19 27.93	2.2708	22 48 33.9	6.827
21	3 21 44.23	2.2726	22 55 19.7	6.701
22	3 24 0.64	2.2745	23 1 58.0	6.574
23	3 26 17.17	2.2763	23 8 28.6	6.445
24	3 28 33.80	2.2781	+23 14 51.4	+ 6.316

NOVEMBER 10.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	h m s	s	° ′ ″	″
0	3 28 33.80	2.2781	+23 14 51.4	+6.316
1	3 30 50.54	2.2798	23 21 6.5	6.186
2	3 33 7.37	2.2813	23 27 13.9	6.056
3	3 35 24.30	2.2830	23 33 13.5	5.926
4	3 37 41.33	2.2845	23 39 5.2	5.797
5	3 39 58.44	2.2859	23 44 49.1	5.667
6	3 42 15.64	2.2873	23 50 25.2	5.535
7	3 44 32.92	2.2886	23 55 53.3	5.403
8	3 46 50.27	2.2898	24 1 13.5	5.271
9	3 49 7.70	2.2911	24 6 25.8	5.138
10	3 51 25.20	2.2922	24 11 30.1	5.005
11	3 53 42.76	2.2933	24 16 26.4	4.871
12	3 56 0.39	2.2943	24 21 14.7	4.738
13	3 58 18.07	2.2952	24 25 55.0	4.604
14	4 0 35.81	2.2960	24 30 27.2	4.470
15	4 2 53.59	2.2968	24 34 51.4	4.336
16	4 5 11.42	2.2975	24 39 7.5	4.201
17	4 7 29.29	2.2981	24 43 15.5	4.066
18	4 9 47.19	2.2986	24 47 15.4	3.930
19	4 12 5.12	2.2991	24 51 7.1	3.795
20	4 14 23.08	2.2995	24 54 50.8	3.660
21	4 16 41.06	2.2998	24 58 26.3	3.523
22	4 18 59.06	2.3001	25 1 53.6	3.388
23	4 21 17.07	2.3002	+25 5 12.8	+3.252

NOVEMBER 11.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
0	4 23 35.08	2.3003	+25 8 23.8	+3.115
1	4 25 53.10	2.3003	25 11 26.6	2.979
2	4 28 11.12	2.3003	25 14 21.3	2.843
3	4 30 29.13	2.3001	25 17 7.8	2.707
4	4 32 47.13	2.2999	25 19 46.1	2.570
5	4 35 5.12	2.2996	25 22 16.2	2.434
6	4 37 23.08	2.2992	25 24 38.2	2.298
7	4 39 41.02	2.2988	25 26 52.0	2.162
8	4 41 58.93	2.2982	25 28 57.6	2.025
9	4 44 16.80	2.2975	25 30 55.0	1.889
10	4 46 34.63	2.2968	25 32 44.2	1.753
11	4 48 52.42	2.2961	25 34 25.3	1.617
12	4 51 10.16	2.2952	25 35 58.2	1.480
13	4 53 27.84	2.2943	25 37 22.9	1.344
14	4 55 45.47	2.2933	25 38 39.5	1.209
15	4 58 3.03	2.2921	25 39 48.0	1.073
16	5 0 20.52	2.2909	25 40 48.3	0.938
17	5 2 37.94	2.2897	25 41 40.5	0.803
18	5 4 55.28	2.2883	25 42 24.6	0.668
19	5 7 12.53	2.2868	25 43 0.6	0.533
20	5 9 29.70	2.2854	25 43 28.6	0.399
21	5 11 46.78	2.2838	25 43 48.5	0.264
22	5 14 3.76	2.2822	25 44 0.3	+0.130
23	5 16 20.64	2.2805	25 44 4.1	−0.003
24	5 18 37.42	2.2787	+25 43 59.9	−0.137

GREENWICH MEAN TIME.

Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
NOVEMBER 12.					NOVEMBER 14.			
h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
5 18 37.42	2.2787	+25 43 59.9	−0.137	0	7 4 43.02	2.1234	+23 12 56.2	− 5.923
5 20 54.08	2.2768	25 43 47.7	0.270	1	7 6 50.30	2.1193	23 6 57.7	6.028
5 23 10.63	2.2748	25 43 27.5	0.403	2	7 8 57.34	2.1153	23 0 52.9	6.131
5 25 27.06	2.2728	25 42 59.4	0.535	3	7 11 4.13	2.1111	22 54 42.0	6.233
5 27 43.37	2.2708	25 42 23.3	0.668	4	7 13 10.67	2.1069	22 48 24.9	6.335
5 29 59.55	2.2685	25 41 39.3	0.798	5	7 15 16.96	2.1028	22 42 1.8	6.436
5 32 15.59	2.2663	25 40 47.5	0.929	6	7 17 23.00	2.0986	22 35 32.6	6.537
5 34 31.50	2.2640	25 39 47.8	1.060	7	7 19 28.79	2.0944	22 28 57.4	6.636
5 36 47.27	2.2616	25 38 40.3	1.190	8	7 21 34.33	2.0903	22 22 16.3	6.734
5 39 2.89	2.2592	25 37 25.0	1.320	9	7 23 39.62	2.0861	22 15 29.3	6.833
5 41 18.37	2.2567	25 36 1.9	1.450	10	7 25 44.66	2.0819	22 8 36.4	6.930
5 43 33.69	2.2540	25 34 31.0	1.579	11	7 27 49.45	2.0778	22 1 37.7	7.026
5 45 48.85	2.2513	25 32 52.4	1.708	12	7 29 53.99	2.0736	21 54 33.3	7.122
5 48 3.85	2.2487	25 31 6.1	1.835	13	7 31 58.28	2.0694	21 47 23.1	7.217
5 50 18.69	2.2459	25 29 12.2	1.963	14	7 34 2.32	2.0653	21 40 7.3	7.310
5 52 33.36	2.2431	25 27 10.6	2.089	15	7 36 6.11	2.0611	21 32 45.9	7.403
5 54 47.86	2.2402	25 25 1.5	2.215	16	7 38 9.65	2.0569	21 25 18.9	7.496
5 57 2.18	2.2372	25 22 44.8	2.341	17	7 40 12.94	2.0528	21 17 46.4	7.588
5 59 16.32	2.2342	25 20 20.6	2.467	18	7 42 15.98	2.0486	21 10 8.4	7.678
6 1 30.28	2.2311	25 17 48.8	2.592	19	7 44 18.77	2.0445	21 2 25.0	7.768
6 3 44.05	2.2279	25 15 9.6	2.716	20	7 46 21.32	2.0404	20 54 36.2	7.858
6 5 57.63	2.2248	25 12 22.9	2.839	21	7 48 23.62	2.0363	20 46 42.1	7.947
6 8 11.02	2.2216	25 9 28.9	2.962	22	7 50 25.68	2.0323	20 38 42.6	8.035
6 10 24.22	2.2183	+25 6 27.5	−3.084	23	7 52 27.50	2.0283	+20 30 37.9	− 8.122
NOVEMBER 13.					NOVEMBER 15.			
6 12 37.21	2.2149	+25 3 18.8	−3.206	0	7 54 29.07	2.0242	+20 22 28.0	− 8.208
6 14 50.01	2.2116	25 0 2.8	3.328	1	7 56 30.40	2.0202	20 14 13.0	8.293
6 17 2.60	2.2081	24 56 39.5	3.448	2	7 58 31.49	2.0162	20 5 52.8	8.378
6 19 14.98	2.2046	24 53 9.0	3.568	3	8 0 32.34	2.0122	19 57 27.6	8.463
6 21 27.15	2.2011	24 49 31.4	3.687	4	8 2 32.95	2.0082	19 48 57.3	8.546
6 23 39.11	2.1975	24 45 46.6	3.806	5	8 4 33.32	2.0043	19 40 22.1	8.628
6 25 50.85	2.1939	24 41 54.7	3.923	6	8 6 33.46	2.0004	19 31 41.9	8.710
6 28 2.38	2.1903	24 37 55.8	4.041	7	8 8 33.37	1.9965	19 22 56.9	8.790
6 30 13.68	2.1865	24 33 49.8	4.158	8	8 10 33.04	1.9926	19 14 7.1	8.871
6 32 24.76	2.1828	24 29 36.9	4.273	9	8 12 32.48	1.9888	19 5 12.4	8.951
6 34 35.62	2.1791	24 25 17.1	4.388	10	8 14 31.69	1.9849	18 56 13.0	9.029
6 36 46.25	2.1753	24 20 50.4	4.502	11	8 16 30.67	1.9812	18 47 8.9	9.108
6 38 56.65	2.1714	24 16 16.9	4.616	12	8 18 29.43	1.9775	18 38 0.1	9.185
6 41 6.82	2.1676	24 11 36.5	4.729	13	8 20 27.97	1.9738	18 28 46.7	9.261
6 43 16.76	2.1637	24 6 49.4	4.842	14	8 22 26.28	1.9700	18 19 28.8	9.337
6 45 26.46	2.1598	24 1 55.5	4.953	15	8 24 24.37	1.9664	18 10 6.3	9.412
6 47 35.93	2.1558	23 56 55.0	5.063	16	8 26 22.25	1.9628	18 0 39.4	9.486
6 49 45.16	2.1519	23 51 47.9	5.173	17	8 28 19.91	1.9593	17 51 8.0	9.560
6 51 54.16	2.1479	23 46 34.2	5.283	18	8 30 17.36	1.9558	17 41 32.2	9.633
6 54 2.91	2.1438	23 41 13.9	5.392	19	8 32 14.60	1.9523	17 31 52.0	9.705
6 56 11.42	2.1398	23 35 47.2	5.499	20	8 34 11.63	1.9488	17 22 7.6	9.776
6 58 19.69	2.1358	23 30 14.0	5.607	21	8 36 8.45	1.9453	17 12 18.9	9.847
7 0 27.71	2.1317	23 24 34.4	5.713	22	8 38 5.07	1.9420	17 2 26.0	9.917
7 2 35.49	2.1276	23 18 48.5	5.818	23	8 40 1.49	1.9386	16 52 28.9	9.986
7 4 43.02	2.1234	+23 12 56.2	−5.923	24	8 41 57.70	1.9353	+16 42 27.7	−10.054

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	NOVEMBER 16.			
	h m s	s	° ′ ″	″
0	8 41 57.70	1.9353	+16 42 27.7	−10.054
1	8 43 53.72	1.9321	16 32 22.4	10.123
2	8 45 49.55	1.9288	16 22 13.0	10.190
3	8 47 45.18	1.9256	16 11 59.6	10.256
4	8 49 40.62	1.9225	16 1 42.3	10.322
5	8 51 35.88	1.9195	15 51 21.0	10.388
6	8 53 30.96	1.9164	15 40 55.8	10.452
7	8 55 25.85	1.9134	15 30 26.8	10.515
8	8 57 20.57	1.9105	15 19 54.0	10.578
9	8 59 15.11	1.9076	15 9 17.4	10.641
10	9 1 9.48	1.9048	14 58 37.1	10.703
11	9 3 3.68	1.9019	14 47 53.1	10.763
12	9 4 57.71	1.8992	14 37 5.5	10.823
13	9 6 51.58	1.8965	14 26 14.3	10.883
14	9 8 45.29	1.8938	14 15 19.5	10.943
15	9 10 38.84	1.8913	14 4 21.2	11.001
16	9 12 32.24	1.8888	13 53 19.4	11.058
17	9 14 25.49	1.8863	13 42 14.2	11.115
18	9 16 18.59	1.8838	13 31 5.6	11.172
19	9 18 11.55	1.8815	13 19 53.6	11.228
20	9 20 4.37	1.8792	13 8 38.3	11.283
21	9 21 57.05	1.8768	12 57 19.7	11.337
22	9 23 49.59	1.8746	12 45 57.9	11.391
23	9 25 42.00	1.8725	+12 34 32.8	−11.444
	NOVEMBER 17.			
0	9 27 34.29	1.8704	+12 23 4.6	−11.497
1	9 29 26.45	1.8683	12 11 33.2	11.548
2	9 31 18.49	1.8663	11 59 58.8	11.599
3	9 33 10.41	1.8644	11 48 21.3	11.650
4	9 35 2.22	1.8626	11 36 40.8	11.700
5	9 36 53.92	1.8608	11 24 57.3	11.749
6	9 38 45.51	1.8590	11 13 10.9	11.798
7	9 40 37.00	1.8573	11 1 21.6	11.846
8	9 42 28.39	1.8558	10 49 29.4	11.893
9	9 44 19.69	1.8542	10 37 34.4	11.940
10	9 46 10.89	1.8526	10 25 36.6	11.987
11	9 48 2.00	1.8512	10 13 36.0	12.032
12	9 49 53.03	1.8498	10 1 32.8	12.076
13	9 51 43.98	1.8485	9 49 26.9	12.121
14	9 53 34.85	1.8473	9 37 18.3	12.165
15	9 55 25.65	1.8461	9 25 7.1	12.208
16	9 57 16.38	1.8449	9 12 53.4	12.249
17	9 59 7.04	1.8438	9 0 37.2	12.291
18	10 0 57.64	1.8428	8 48 18.5	12.333
19	10 2 48.18	1.8418	8 35 57.3	12.373
20	10 4 38.66	1.8409	8 23 33.7	12.413
21	10 6 29.09	1.8402	8 11 7.7	12.453
22	10 8 19.48	1.8395	7 58 39.4	12.491
23	10 10 9.83	1.8388	7 46 8.8	12.529
24	*10 12 0.14*	*1.8383*	*+ 7 33 35.9*	*−12.567*

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	NOVEMBER 18.			
	h m s	s	° ′ ″	″
0	10 12 0.14	1.8383	+7 33 35.9	−12.567
1	10 13 50.42	1.8377	7 21 0.8	12.603
2	10 15 40.66	1.8372	7 8 23.5	12.639
3	10 17 30.88	1.8368	6 55 44.1	12.674
4	10 19 21.07	1.8364	6 43 2.6	12.709
5	10 21 11.25	1.8362	6 30 19.0	12.743
6	10 23 1.41	1.8359	6 17 33.4	12.777
7	10 24 51.56	1.8358	6 4 45.8	12.810
8	10 26 41.71	1.8358	5 51 56.2	12.843
9	10 28 31.85	1.8358	5 39 4.7	12.874
10	10 30 22.00	1.8358	5 26 11.3	12.905
11	10 32 12.15	1.8359	5 13 16.0	12.936
12	10 34 2.31	1.8362	5 0 19.0	12.965
13	10 35 52.49	1.8365	4 47 20.2	12.994
14	10 37 42.69	1.8368	4 34 19.7	13.023
15	10 39 32.91	1.8372	4 21 17.5	13.051
16	10 41 23.15	1.8377	4 8 13.6	13.078
17	10 43 13.43	1.8383	3 55 8.1	13.104
18	10 45 3.75	1.8390	3 42 1.1	13.130
19	10 46 54.11	1.8397	3 28 52.5	13.155
20	10 48 44.51	1.8404	3 15 42.5	13.179
21	10 50 34.96	1.8413	3 2 31.0	13.203
22	10 52 25.47	1.8423	2 49 18.1	13.227
23	10 54 16.03	1.8433	+2 36 3.8	−13.248
	NOVEMBER 19.			
0	10 56 6.66	1.8443	+2 22 48.3	−13.270
1	10 57 57.35	1.8454	2 9 31.4	13.292
2	10 59 48.11	1.8467	1 56 13.3	13.312
3	11 1 38.95	1.8480	1 42 54.0	13.332
4	11 3 29.87	1.8494	1 29 33.5	13.351
5	11 5 20.88	1.8508	1 16 11.9	13.368
6	11 7 11.97	1.8523	1 2 49.3	13.386
7	11 9 3.16	1.8539	0 49 25.6	13.403
8	11 10 54.44	1.8556	0 36 1.0	13.418
9	11 12 45.83	1.8573	0 22 35.4	13.434
10	11 14 37.32	1.8592	+0 9 8.9	13.449
11	11 16 28.93	1.8611	−0 4 18.5	13.463
12	11 18 20.65	1.8630	0 17 46.6	13.475
13	11 20 12.49	1.8651	0 31 15.5	13.488
14	11 22 4.46	1.8673	0 44 45.1	13.499
15	11 23 56.56	1.8694	0 58 15.4	13.510
16	11 25 48.79	1.8717	1 11 46.3	13.520
17	11 27 41.16	1.8740	1 25 17.8	13.529
18	11 29 33.67	1.8764	1 38 49.8	13.538
19	11 31 26.33	1.8790	1 52 22.3	13.545
20	11 33 19.15	1.8816	2 5 55.2	13.552
21	11 35 12.12	1.8843	2 19 28.5	13.558
22	11 37 5.26	1.8870	2 33 2.1	13.563
23	11 38 58.56	1.8898	2 46 36.0	13.567
24	11 40 52.03	1.8927	−3 0 10.1	−13.570

GREENWICH MEAN TIME.

Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
NOVEMBER 20.					NOVEMBER 22.			
h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
11 40 52.03	1.8927	− 3 0 10.1	−13.570	0	13 16 30.90	2.1214	−13 36 42.8	−12.518
11 42 45.68	1.8957	3 13 44.4	13.573	1	13 18 38.38	2.1279	13 49 12.3	12.466
11 44 39.51	1.8988	3 27 18.8	13.574	2	13 20 46.25	2.1344	14 1 38.7	12.413
11 46 33.53	1.9018	3 40 53.3	13.575	3	13 22 54.51	2.1411	14 14 1.8	12.357
11 48 27.73	1.9050	3 54 27.8	13.574	4	13 25 3.18	2.1478	14 26 21.5	12.300
11 50 22.13	1.9083	4 8 2.2	13.573	5	13 27 12.25	2.1546	14 38 37.8	12.243
11 52 16.73	1.9117	4 21 36.6	13.572	6	13 29 21.73	2.1613	14 50 50.6	12.183
11 54 11.53	1.9151	4 35 10.8	13.569	7	13 31 31.61	2.1682	15 2 59.7	12.121
11 56 6.54	1.9186	4 48 44.9	13.566	8	13 33 41.91	2.1752	15 15 5.1	12.058
11 58 1.76	1.9222	5 2 18.7	13.560	9	13 35 52.63	2.1821	15 27 6.7	11.994
11 59 57.20	1.9259	5 15 52.1	13.554	10	13 38 3.76	2.1890	15 39 4.4	11.928
12 1 52.87	1.9297	5 29 25.2	13.548	11	13 40 15.31	2.1961	15 50 58.1	11.861
12 3 48.76	1.9334	5 42 57.9	13.541	12	13 42 27.29	2.2032	16 2 47.7	11.792
12 5 44.88	1.9373	5 56 30.1	13.532	13	13 44 39.69	2.2103	16 14 33.1	11.721
12 7 41.24	1.9413	6 10 1.7	13.522	14	13 46 52.53	2.2176	16 26 14.2	11.648
12 9 37.84	1.9454	6 23 32.7	13.512	15	13 49 5.80	2.2248	16 37 50.9	11.574
12 11 34.69	1.9496	6 37 3.1	13.500	16	13 51 19.51	2.2321	16 49 23.1	11.499
12 13 31.79	1.9538	6 50 32.7	13.488	17	13 53 33.65	2.2393	17 0 50.8	11.423
12 15 29.15	1.9581	7 4 1.6	13.474	18	13 55 48.23	2.2467	17 12 13.8	11.343
12 17 26.76	1.9623	7 17 29.6	13.459	19	13 58 3.25	2.2541	17 23 32.0	11.263
12 19 24.63	1.9668	7 30 56.7	13.443	20	14 0 18.72	2.2616	17 34 45.3	11.180
12 21 22.78	1.9714	7 44 22.8	13.427	21	14 2 34.64	2.2690	17 45 53.6	11.096
12 23 21.20	1.9760	7 57 47.9	13.409	22	14 4 51.00	2.2764	17 56 56.8	11.011
12 25 19.90	1.9807	− 8 11 11.9	−13.390	23	14 7 7.81	2.2840	−18 7 54.9	−10.924
NOVEMBER 21.					NOVEMBER 23.			
12 27 18.88	1.9854	− 8 24 34.7	−13.370	0	14 9 25.08	2.2916	−18 18 47.7	−10.835
12 29 18.15	1.9903	8 37 56.3	13.348	1	14 11 42.80	2.2991	18 29 35.1	10.744
12 31 17.71	1.9952	8 51 16.5	13.325	2	14 14 0.97	2.3066	18 40 17.0	10.652
12 33 17.57	2.0002	9 4 35.3	13.302	3	14 16 19.59	2.3142	18 50 53.3	10.558
12 35 17.73	2.0052	9 17 52.7	13.278	4	14 18 38.67	2.3218	19 1 23.9	10.462
12 37 18.19	2.0103	9 31 8.6	13.252	5	14 20 58.21	2.3294	19 11 48.7	10.364
12 39 18.97	2.0156	9 44 22.9	13.225	6	14 23 18.20	2.3370	19 22 7.6	10.264
12 41 20.06	2.0208	9 57 35.6	13.197	7	14 25 38.65	2.3447	19 32 20.4	10.163
12 43 21.47	2.0262	10 10 46.5	13.167	8	14 27 59.56	2.3523	19 42 27.1	10.060
12 45 23.20	2.0316	10 23 55.6	13.136	9	14 30 20.92	2.3599	19 52 27.6	9.956
12 47 25.26	2.0371	10 37 2.8	13.104	10	14 32 42.75	2.3676	20 2 21.8	9.849
12 49 27.65	2.0427	10 50 8.1	13.071	11	14 35 5.03	2.3752	20 12 9.5	9.741
12 51 30.38	2.0483	11 3 11.3	13.036	12	14 37 27.77	2.3828	20 21 50.7	9.632
12 53 33.45	2.0541	11 16 12.4	13.000	13	14 39 50.97	2.3904	20 31 25.3	9.520
12 55 36.87	2.0598	11 29 11.3	12.963	14	14 42 14.62	2.3980	20 40 53.1	9.406
12 57 40.63	2.0656	11 42 8.0	12.925	15	14 44 38.73	2.4056	20 50 14.0	9.290
12 59 44.74	2.0716	11 55 2.3	12.885	16	14 47 3.29	2.4132	20 59 27.9	9.173
13 1 49.22	2.0777	12 7 54.2	12.844	17	14 49 28.31	2.4207	21 8 34.8	9.055
13 3 54.06	2.0837	12 20 43.6	12.802	18	14 51 53.77	2.4282	21 17 34.5	8.934
13 5 59.26	2.0898	12 33 30.4	12.758	19	14 54 19.69	2.4358	21 26 26.9	8.812
13 8 4.83	2.0960	12 46 14.6	12.713	20	14 56 46.06	2.4433	21 35 11.9	8.688
13 10 10.78	2.1023	12 58 56.0	12.667	21	14 59 12.88	2.4506	21 43 49.5	8.563
13 12 17.10	2.1086	13 11 34.6	12.618	22	15 1 40.13	2.4579	21 52 19.4	8.434
13 14 23.81	2.1150	13 24 10.2	12.568	23	15 4 7.83	2.4653	22 0 41.6	8.306
13 16 30.90	*2.1214*	*−13 36 42.8*	−12.518	24	15 6 35.97	2.4727	−22 8 56.0	− 8.174

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	NOVEMBER 24.			
	h m s	s	° ′ ″	″
0	15 6 35.97	2.4727	−22 8 56.0	−8.174
1	15 9 4.55	2.4799	22 17 2.5	8.042
2	15 11 33.56	2.4871	22 25 1.0	7.908
3	15 14 3.00	2.4943	22 32 51.4	7.771
4	15 16 32.87	2.5013	22 40 33.5	7.633
5	15 19 3.16	2.5083	22 48 7.3	7.493
6	15 21 33.87	2.5153	22 55 32.7	7.353
7	15 24 4.99	2.5222	23 2 49.6	7.210
8	15 26 36.53	2.5290	23 9 57.9	7.066
9	15 29 8.47	2.5357	23 16 57.5	6.920
10	15 31 40.81	2.5423	23 23 48.3	6.772
11	15 34 13.55	2.5489	23 30 30.1	6.622
12	15 36 46.68	2.5554	23 37 2.9	6.472
13	15 39 20.20	2.5618	23 43 26.7	6.319
14	15 41 54.10	2.5681	23 49 41.2	6.164
15	15 44 28.37	2.5743	23 55 46.4	6.009
16	15 47 3.01	2.5804	24 1 42.3	5.853
17	15 49 38.02	2.5864	24 7 28.7	5.694
18	15 52 13.38	2.5923	24 13 5.6	5.535
19	15 54 49.09	2.5980	24 18 32.9	5.373
20	15 57 25.14	2.6036	24 23 50.4	5.211
21	16 0 1.52	2.6091	24 28 58.2	5.048
22	16 2 38.23	2.6146	24 33 56.1	4.882
23	16 5 15.27	2.6199	−24 38 44.0	−4.715
	NOVEMBER 25.			
0	16 7 52.62	2.6251	−24 43 21.9	−4.548
1	16 10 30.28	2.6301	24 47 49.7	4.378
2	16 13 8.23	2.6349	24 52 7.3	4.208
3	16 15 46.47	2.6397	24 56 14.7	4.037
4	16 18 24.99	2.6443	25 0 11.7	3.863
5	16 21 3.78	2.6488	25 3 58.3	3.690
6	16 23 42.84	2.6531	25 7 34.5	3.516
7	16 26 22.15	2.6572	25 11 0.2	3.340
8	16 29 1.70	2.6612	25 14 15.3	3.163
9	16 31 41.49	2.6651	25 17 19.8	2.986
10	16 34 21.51	2.6688	25 20 13.6	2.808
11	16 37 1.75	2.6723	25 22 56.7	2.628
12	16 39 42.19	2.6757	25 25 29.0	2.448
13	16 42 22.83	2.6789	25 27 50.4	2.266
14	16 45 3.66	2.6820	25 30 0.9	2.084
15	16 47 44.67	2.6848	25 32 0.5	1.902
16	16 50 25.84	2.6875	25 33 49.1	1.718
17	16 53 7.17	2.6901	25 35 26.7	1.535
18	16 55 48.65	2.6924	25 36 53.3	1.351
19	16 58 30.26	2.6946	25 38 8.8	1.165
20	17 1 12.00	2.6966	25 39 13.1	0.979
21	17 3 53.85	2.6984	25 40 6.3	0.794
22	17 6 35.81	2.7002	25 40 48.4	0.608
23	17 9 17.87	2.7017	25 41 19.3	0.422
24	*17 12 0.01*	*2.7029*	*−25 41 39.0*	−0.234

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	NOVEMBER 26.			
	h m s	s	° ′ ″	″
0	17 12 0.01	2.7029	−25 41 39.0	−0.234
1	17 14 42.22	2.7040	25 41 47.4	−0.047
2	17 17 24.49	2.7049	25 41 44.6	+0.140
3	17 20 6.81	2.7057	25 41 30.6	0.328
4	17 22 49.17	2.7063	25 41 5.3	0.516
5	17 25 31.56	2.7067	25 40 28.7	0.703
6	17 28 13.97	2 7069	25 39 40.9	0.891
7	17 30 56.39	2.7069	25 38 41.8	1.078
8	17 33 38.80	2.7068	25 37 31.5	1.266
9	17 36 21.20	2.7064	25 36 9.9	1.454
10	17 39 3.57	2.7059	25 34 37.0	1.642
11	17 41 45.91	2.7053	25 32 52.9	1.828
12	17 44 28.20	2.7043	25 30 57.6	2.016
13	17 47 10.43	2.7033	25 28 51.0	2.203
14	17 49 52.59	2.7021	25 26 33.3	2.388
15	17 52 34.68	2.7008	25 24 4.4	2.574
16	17 55 16.68	2.6991	25 21 24.4	2.760
17	17 57 58.57	2.6973	25 18 33.2	2.945
18	18 0 40.35	2.6954	25 15 31.0	3.129
19	18 3 22.02	2.6934	25 12 17.7	3.313
20	18 6 3.56	2.6912	25 8 53.4	3.497
21	18 8 44.96	2.6888	25 5 18.1	3.679
22	18 11 26.21	2.6862	25 1 31.9	3.861
23	18 14 7.30	2.6834	−24 57 34.8	+4.043
	NOVEMBER 27.			
0	18 16 48.22	2.6805	−24 53 26.8	+4.223
1	18 19 28.96	2.6775	24 49 8.0	4.403
2	18 22 9.52	2.6743	24 44 38.5	4.581
3	18 24 49.88	2.6710	24 39 58.3	4.759
4	18 27 30.04	2.6676	24 35 7.4	4.936
5	18 30 9.99	2.6639	24 30 6.0	5.112
6	18 32 49.71	2.6601	24 24 54.0	5.287
7	18 35 29.20	2.6562	24 19 31.6	5.460
8	18 38 8.45	2.6521	24 13 58.8	5.633
9	18 40 47.45	2.6479	24 8 15.6	5.805
10	18 43 26.20	2.6437	24 2 22.2	5.975
11	18 46 4.69	2.6393	23 56 18.6	6.145
12	18 48 42.91	2.6347	23 50 4.8	6.313
13	18 51 20.85	2.6300	23 43 41.0	6.480
14	18 53 58.51	2.6253	23 37 7.2	6.645
15	18 56 35.88	2.6203	23 30 23.6	6.808
16	18 59 12.95	2.6153	23 23 30.2	6.972
17	19 1 49.72	2.6103	23 16 27.0	7.133
18	19 4 26.18	2.6050	23 9 14.2	7.293
19	19 7 2.32	2.5997	23 1 51.8	7.453
20	19 9 38.14	2.5943	22 54 19.9	7.609
21	19 12 13.64	2.5888	22 46 38.7	7.764
22	19 14 48.80	2.5833	22 38 48.2	7.919
23	19 17 23.63	2.5777	22 30 48.4	8.073
24	19 19 58.12	2.5719	−22 22 39.5	+8.223

GREENWICH MEAN TIME.

NOVEMBER 28.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	h m s	s	° ′ ″	″
0	19 19 58.12	2.5719	−22 22 39.5	+ 8.223
1	19 22 32.26	2.5661	22 14 21.6	8.373
2	19 25 6.05	2.5602	22 5 54.8	8.521
3	19 27 39.48	2.5542	21 57 19.1	8.668
4	19 30 12.55	2.5482	21 48 34.7	8.812
5	19 32 45.26	2.5422	21 39 41.7	8.955
6	19 35 17.61	2.5361	21 30 40.1	9.097
7	19 37 49.59	2.5298	21 21 30.1	9.237
8	19 40 21.19	2.5236	21 12 11.7	9.375
9	19 42 52.42	2.5173	21 2 45.1	9.512
10	19 45 23.27	2.5110	20 53 10.3	9.647
11	19 47 53.74	2.5046	20 43 27.5	9.779
12	19 50 23.82	2.4982	20 33 36.8	9.911
13	19 52 53.52	2.4918	20 23 38.2	10.041
14	19 55 22.83	2.4853	20 13 31.9	10.168
15	19 57 51.76	2.4789	20 3 18.0	10.294
16	20 0 20.30	2.4723	19 52 56.6	10.418
17	20 2 48.44	2.4658	19 42 27.8	10.542
18	20 5 16.20	2.4593	19 31 51.6	10.663
19	20 7 43.56	2.4528	19 21 8.2	10.782
20	20 10 10.53	2.4462	19 10 17.8	10.899
21	20 12 37.10	2.4396	18 59 20.3	11.015
22	20 15 3.28	2.4331	18 48 16.0	11.128
23	20 17 29.07	2.4265	−18 37 4.9	+11.241

NOVEMBER 29.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
0	20 19 54.46	2.4199	−18 25 47.1	+11.351
1	20 22 19.46	2.4133	18 14 22.8	11.458
2	20 24 44.06	2.4068	18 2 52.1	11.565
3	20 27 8.27	2.4003	17 51 15.0	11.671
4	20 29 32.09	2.3938	17 39 31.6	11.774
5	20 31 55.52	2.3872	17 27 42.1	11.875
6	20 34 18.55	2.3807	17 15 46.6	11.974
7	20 36 41.20	2.3743	17 3 45.2	12.072
8	20 39 3.46	2.3678	16 51 38.0	12.168
9	20 41 25.33	2.3613	16 39 25.0	12.263
10	20 43 46.81	2.3549	16 27 6.5	12.354
11	20 46 7.92	2.3486	16 14 42.5	12.445
12	20 48 28.64	2.3422	16 2 13.1	12.534
13	20 50 48.98	2.3359	15 49 38.4	12.621
14	20 53 8.95	2.3297	15 36 58.6	12.706
15	20 55 28.54	2.3234	15 24 13.7	12.789
16	20 57 47.76	2.3173	15 11 23.9	12.871
17	21 0 6.61	2.3111	14 58 29.2	12.952
18	21 2 25.09	2.3049	14 45 29.7	13.030
19	21 4 43.20	2.2988	14 32 25.6	13.107
20	21 7 0.95	2.2929	14 19 16.9	13.182
21	21 9 18.35	2.2870	14 6 3.8	13.255
22	21 11 35.39	2.2811	13 52 46.3	13.327
23	21 13 52.08	2.2752	13 39 24.6	13.396
24	21 16 8.41	2.2693	−13 25 58.8	+13.463

NOVEMBER 30.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	h m s	s	° ′ ″	″
0	21 16 8.41	2.2693	−13 25 58.8	+13.463
1	21 18 24.40	2.2637	13 12 29.0	13.530
2	21 20 40.05	2.2580	12 58 55.2	13.595
3	21 22 55.36	2.2524	12 45 17.6	13.658
4	21 25 10.34	2.2468	12 31 36.2	13.720
5	21 27 24.98	2.2413	12 17 51.2	13.780
6	21 29 39.29	2.2358	12 4 2.6	13.838
7	21 31 53.28	2.2305	11 50 10.6	13.894
8	21 34 6.95	2.2252	11 36 15.3	13.949
9	21 36 20.30	2.2199	11 22 16.7	14.003
10	21 38 33.34	2.2148	11 8 15.0	14.054
11	21 40 46.07	2.2097	10 54 10.2	14.105
12	21 42 58.50	2.2047	10 40 2.4	14.153
13	21 45 10.63	2.1997	10 25 51.8	14.200
14	21 47 22.46	2.1948	10 11 38.4	14.246
15	21 49 34.00	2.1899	9 57 22.3	14.289
16	21 51 45.25	2.1852	9 43 3.7	14.332
17	21 53 56.22	2.1805	9 28 42.5	14.373
18	21 56 6.91	2.1758	9 14 19.0	14.412
19	21 58 17.32	2.1713	8 59 53.1	14.450
20	22 0 27.47	2.1670	8 45 25.0	14.486
21	22 2 37.36	2.1626	8 30 54.8	14.521
22	22 4 46.98	2.1583	8 16 22.5	14.555
23	22 6 56.35	2.1540	− 8 1 48.2	+14.587

DECEMBER 1.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
0	22 9 5.46	2.1498	− 7 47 12.1	+14.617
1	22 11 14.33	2.1458	7 32 34.2	14.646
2	22 13 22.95	2.1418	7 17 54.6	14.673
3	22 15 31.34	2.1379	7 3 13.4	14.699
4	22 17 39.50	2.1341	6 48 30.7	14.724
5	22 19 47.43	2.1303	6 33 46.5	14.748
6	22 21 55.14	2.1267	6 19 1.0	14.769
7	22 24 2.63	2.1231	6 4 14.2	14.790
8	22 26 9.91	2.1196	5 49 26.2	14.809
9	22 28 16.98	2.1161	5 34 37.1	14.827
10	22 30 23.84	2.1128	5 19 47.0	14.843
11	22 32 30.51	2.1095	5 4 55.9	14.858
12	22 34 36.98	2.1063	4 50 4.0	14.872
13	22 36 43.27	2.1033	4 35 11.3	14.884
14	22 38 49.37	2.1002	4 20 17.9	14.895
15	22 40 55.29	2.0973	4 5 23.9	14.905
16	22 43 1.04	2.0944	3 50 29.3	14.914
17	22 45 6.62	2.0916	3 35 34.2	14.921
18	22 47 12.03	2.0888	3 20 38.8	14.927
19	22 49 17.28	2.0863	3 5 43.0	14.932
20	22 51 22.38	2.0838	2 50 47.0	14.934
21	22 53 27.33	2.0813	2 35 50.9	14.936
22	22 55 32.13	2.0789	2 20 54.7	14.938
23	22 57 36.80	2.0767	2 5 58.4	14.938
24	22 59 41.33	2.0744	− 1 51 2.2	+14.935

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	DECEMBER 2.					DECEMBER 4.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	22 59 41.33	2.0744	−1 51 2.2	+14.935	0	0 38 12.26	2.0585	+ 9 41 41.0	+13.503
1	23 1 45.73	2.0723	1 36 6.2	14.932	1	0 40 15.81	2.0598	9 55 9.5	13.447
2	23 3 50.00	2.0703	1 21 10.4	14.928	2	0 42 19.43	2.0612	10 8 34.6	13.389
3	23 5 54.16	2.0683	1 6 14.8	14.923	3	0 44 23.15	2.0628	10 21 56.2	13.331
4	23 7 58.20	2.0664	0 51 19.6	14.916	4	0 46 26.96	2.0642	10 35 14.3	13.272
5	23 10 2.13	2.0646	0 36 24.9	14.908	5	0 48 30.85	2.0658	10 48 28.8	13.212
6	23 12 5.95	2.0628	0 21 30.7	14.898	6	0 50 34.85	2.0674	11 1 39.7	13.150
7	23 14 9.67	2.0613	−0 6 37.1	14.889	7	0 52 38.94	2.0690	11 14 46.8	13.088
8	23 16 13.30	2.0597	+0 8 16.0	14.878	8	0 54 43.13	2.0708	11 27 50.2	13.025
9	23 18 16.83	2.0582	0 23 8.3	14.865	9	0 56 47.43	2.0726	11 40 49.8	12.961
10	23 20 20.28	2.0568	0 37 59.8	14.851	10	0 58 51.84	2.0744	11 53 45.5	12.895
11	23 22 23.65	2.0555	0 52 50.4	14.836	11	1 0 56.36	2.0763	12 6 37.2	12.828
12	23 24 26.94	2.0543	1 7 40.1	14.820	12	1 3 1.00	2.0783	12 19 24.9	12.761
13	23 26 30.16	2.0531	1 22 28.8	14.803	13	1 5 5.75	2.0802	12 32 8.5	12.693
14	23 28 33.31	2.0520	1 37 16.4	14.784	14	1 7 10.62	2.0822	12 44 48.0	12.623
15	23 30 36.40	2.0510	1 52 2.9	14.764	15	1 9 15.61	2.0843	12 57 23.3	12.553
16	23 32 39.43	2.0501	2 6 48.1	14.743	16	1 11 20.73	2.0864	13 9 54.4	12.482
17	23 34 42.41	2.0493	2 21 32.1	14.722	17	1 13 25.98	2.0886	13 22 21.1	12.409
18	23 36 45.34	2.0484	2 36 14.7	14.699	18	1 15 31.36	2.0908	13 34 43.5	12.336
19	23 38 48.22	2.0477	2 50 56.0	14.675	19	1 17 36.87	2.0929	13 47 1.4	12.262
20	23 40 51.06	2.0471	3 5 35.7	14.649	20	1 19 42.51	2.0952	13 59 14.9	12.187
21	23 42 53.87	2.0466	3 20 13.9	14.623	21	1 21 48.29	2.0975	14 11 23.8	12.110
22	23 44 56.65	2.0461	3 34 50.5	14.596	22	1 23 54.21	2.0999	14 23 28.1	12.033
23	23 46 59.40	2.0457	+3 49 25.4	+14.568	23	1 26 0.28	2.1023	+14 35 27.7	+11.954
	DECEMBER 3.					DECEMBER 5.			
0	23 49 2.13	2.0453	+4 3 58.6	+14.538	0	1 28 6.49	2.1048	+14 47 22.6	+11.875
1	23 51 4.84	2.0451	4 18 29.9	14.507	1	1 30 12.85	2.1072	14 59 12.7	11.795
2	23 53 7.54	2.0450	4 32 59.4	14.475	2	1 32 19.35	2.1096	15 10 58.0	11.714
3	23 55 10.24	2.0449	4 47 26.9	14.442	3	1 34 26.00	2.1122	15 22 38.4	11.633
4	23 57 12.93	2.0448	5 1 52.4	14.408	4	1 36 32.81	2.1148	15 34 13.9	11.549
5	23 59 15.62	2.0448	5 16 15.8	14.373	5	1 38 39.77	2.1173	15 45 44.3	11.464
6	0 1 18.31	2.0449	5 30 37.1	14.337	6	1 40 46.88	2.1199	15 57 9.6	11.379
7	0 3 21.01	2.0452	5 44 56.2	14.299	7	1 42 54.16	2.1226	16 8 29.8	11.294
8	0 5 23.73	2.0454	5 59 13.0	14.260	8	1 45 1.59	2.1252	16 19 44.9	11.208
9	0 7 26.46	2.0457	6 13 27.4	14.221	9	1 47 9.18	2.1278	16 30 54.7	11.119
10	0 9 29.21	2.0461	6 27 39.5	14.181	10	1 49 16.93	2.1306	16 41 59.2	11.031
11	0 11 31.99	2.0466	6 41 49.1	14.139	11	1 51 24.85	2.1333	16 52 58.4	10.941
12	0 13 34.80	2.0472	6 55 56.2	14.097	12	1 53 32.93	2.1360	17 3 52.1	10.850
13	0 15 37.65	2.0478	7 10 0.7	14.053	13	1 55 41.17	2.1388	17 14 40.4	10.759
14	0 17 40.53	2.0483	7 24 2.5	14.008	14	1 57 49.58	2.1416	17 25 23.2	10.667
15	0 19 43.45	2.0490	7 38 1.6	13.962	15	1 59 58.16	2.1444	17 36 0.4	10.573
16	0 21 46.41	2.0498	7 51 57.9	13.915	16	2 2 6.91	2.1472	17 46 31.9	10.478
17	0 23 49.43	2.0508	8 5 51.4	13.868	17	2 4 15.82	2.1499	17 56 57.8	10.384
18	0 25 52.50	2.0517	8 19 42.0	13.818	18	2 6 24.90	2.1528	18 7 18.0	10.288
19	0 27 55.63	2.0527	8 33 29.6	13.768	19	2 8 34.15	2.1557	18 17 32.3	10.190
20	0 29 58.82	2.0538	8 47 14.2	13.718	20	2 10 43.58	2.1585	18 27 40.8	10.093
21	0 32 2.08	2.0548	9 0 55.7	13.665	21	2 12 53.17	2.1613	18 37 43.4	9.994
22	0 34 5.40	2.0559	9 14 34.0	13.612	22	2 15 2.93	2.1641	18 47 40.1	9.894
23	0 36 8.79	2.0572	9 28 9.1	13.558	23	2 17 12.86	2.1670	18 57 30.7	9.793
24	*0 38 12.26*	*2.0585*	*+9 41 41.0*	+13.503	24	2 19 22.97	2.1699	+19 7 15.3	+ 9.693

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	DECEMBER 6.			
	h m s	s	° ′ ″	″
0	2 19 22.97	2.1699	+19 7 15.3	+9.693
1	2 21 33.25	2.1727	19 16 53.8	9.590
2	2 23 43.69	2.1755	19 26 26.1	9.487
3	2 25 54.31	2.1784	19 35 52.2	9.383
4	2 28 5.10	2.1813	19 45 12.0	9.278
5	2 30 16.06	2.1841	19 54 25.5	9.173
6	2 32 27.19	2.1869	20 3 32.7	9.067
7	2 34 38.49	2.1898	20 12 33.5	8.959
8	2 36 49.96	2.1926	20 21 27.8	8.851
9	2 39 1.60	2.1953	20 30 15.6	8.742
10	2 41 13.40	2.1981	20 38 56.8	8.632
11	2 43 25.37	2.2009	20 47 31.4	8.522
12	2 45 37.51	2.2037	20 55 59.4	8.411
13	2 47 49.81	2.2063	21 4 20.7	8.298
14	2 50 2.27	2.2091	21 12 35.2	8.186
15	2 52 14.90	2.2118	21 20 43.0	8.073
16	2 54 27.68	2.2143	21 28 43.9	7.958
17	2 56 40.62	2.2170	21 36 37.9	7.843
18	2 58 53.72	2.2197	21 44 25.0	7.728
19	3 1 6.98	2.2223	21 52 5.2	7.611
20	3 3 20.39	2.2248	21 59 38.3	7.493
21	3 5 33.95	2.2273	22 7 4.4	7.376
22	3 7 47.66	2.2298	22 14 23.4	7.258
23	3 10 1.52	2.2322	+22 21 35.3	+7.138
	DECEMBER 7.			
0	3 12 15.52	2.2346	+22 28 40.0	+7.018
1	3 14 29.67	2.2370	22 35 37.5	6.898
2	3 16 43.96	2.2393	22 42 27.8	6.778
3	3 18 58.38	2.2415	22 49 10.8	6.656
4	3 21 12.94	2.2438	22 55 46.5	6.533
5	3 23 27.63	2.2460	23 2 14.8	6.410
6	3 25 42.46	2.2482	23 8 35.7	6.287
7	3 27 57.41	2.2502	23 14 49.2	6.163
8	3 30 12.48	2.2524	23 20 55.2	6.038
9	3 32 27.68	2.2543	23 26 53.8	5.913
10	3 34 42.99	2.2562	23 32 44.8	5.788
11	3 36 58.42	2.2581	23 38 28.3	5.662
12	3 39 13.96	2.2599	23 44 4.2	5.535
13	3 41 29.61	2.2617	23 49 32.5	5.408
14	3 43 45.36	2.2634	23 54 53.1	5.280
15	3 46 1.22	2.2651	24 0 6.1	5.153
16	3 48 17.17	2.2667	24 5 11.4	5.024
17	3 50 33.22	2.2683	24 10 9.0	4.895
18	3 52 49.36	2.2697	24 14 58.8	4.766
19	3 55 5.58	2.2711	24 19 40.9	4.636
20	3 57 21.89	2.2724	24 24 15.1	4.506
21	3 59 38.27	2.2737	24 28 41.6	4.376
22	4 1 54.73	2.2749	24 33 0.2	4.245
23	4 4 11.26	2.2761	24 37 11.0	4.114
24	4 6 27.86	*2.2772*	*+24 41 13.9*	+3.983

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	DECEMBER 8.			
	h m s	s	° ′ ″	″
0	4 6 27.86	2.2772	+24 41 13.9	+3.983
1	4 8 44.52	2.2781	24 45 8.9	3.851
2	4 11 1.23	2.2790	24 48 56.0	3.719
3	4 13 18.00	2.2799	24 52 35.2	3.587
4	4 15 34.82	2.2808	24 56 6.4	3.454
5	4 17 51.69	2.2814	24 59 29.7	3.322
6	4 20 8.59	2.2820	25 2 45.0	3.188
7	4 22 25.53	2.2826	25 5 52.3	3.056
8	4 24 42.50	2.2830	25 8 51.7	2.923
9	4 26 59.49	2.2834	25 11 43.1	2.789
10	4 29 16.51	2.2838	25 14 26.4	2.656
11	4 31 33.54	2.2840	25 17 1.8	2.523
12	4 33 50.59	2.2842	25 19 29.1	2.388
13	4 36 7.64	2.2843	25 21 48.4	2.255
14	4 38 24.70	2.2843	25 23 59.7	2.121
15	4 40 41.76	2.2843	25 26 2.9	1.987
16	4 42 58.81	2.2841	25 27 58.1	1.853
17	4 45 15.85	2.2838	25 29 45.3	1.719
18	4 47 32.87	2.2835	25 31 24.4	1.585
19	4 49 49.87	2.2831	25 32 55.5	1.452
20	4 52 6.84	2.2826	25 34 18.6	1.318
21	4 54 23.78	2.2821	25 35 33.6	1.183
22	4 56 40.69	2.2814	25 36 40.6	1.050
23	4 58 57.55	2.2807	+25 37 39.6	+0.917
	DECEMBER 9.			
0	5 1 14.37	2.2799	+25 38 30.6	+0.783
1	5 3 31.14	2.2790	25 39 13.6	0.649
2	5 5 47.85	2.2781	25 39 48.5	0.516
3	5 8 4.51	2.2771	25 40 15.5	0.383
4	5 10 21.10	2.2759	25 40 34.5	0.250
5	5 12 37.62	2.2747	25 40 45.5	+0.118
6	5 14 54.06	2.2733	25 40 48.6	−0.015
7	5 17 10.42	2.2720	25 40 43.7	0.148
8	5 19 26.70	2.2706	25 40 30.9	0.279
9	5 21 42.89	2.2691	25 40 10.2	0.411
10	5 23 58.99	2.2675	25 39 41.6	0.543
11	5 26 14.99	2.2658	25 39 5.1	0.673
12	5 28 30.88	2.2640	25 38 20.8	0.804
13	5 30 46.67	2.2622	25 37 28.6	0.935
14	5 33 2.34	2.2602	25 36 28.6	1.065
15	5 35 17.89	2.2582	25 35 20.8	1.195
16	5 37 33.32	2.2562	25 34 5.2	1.324
17	5 39 48.63	2.2541	25 32 41.9	1.453
18	5 42 3.81	2.2518	25 31 10.8	1.583
19	5 44 18.85	2.2495	25 29 32.0	1.710
20	5 46 33.75	2.2472	25 27 45.6	1.838
21	5 48 48.51	2.2448	25 25 51.5	1.965
22	5 51 3.12	2.2423	25 23 49.8	2.092
23	5 53 17.58	2.2398	25 21 40.5	2.218
24	5 55 31.89	2.2372	+25 19 23.6	−2.34[illegible]

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	DECEMBER 10.			
	h m s	s	° ′ ″	″
0	5 55 31.89	2.2372	+25 19 23.6	−2.344
1	5 57 46.04	2.2344	25 16 59.2	2.470
2	6 0 0.02	2.2316	25 14 27.2	2.595
3	6 2 13.83	2.2288	25 11 47.8	2.718
4	6 4 27.47	2.2259	25 9 1.0	2.843
5	6 6 40.94	2.2230	25 6 6.7	2.966
6	6 8 54.23	2.2200	25 3 5.1	3.088
7	6 11 7.34	2.2169	24 59 56.1	3.211
8	6 13 20.26	2.2138	24 56 39.8	3.332
9	6 15 32.99	2.2106	24 53 16.3	3.453
10	6 17 45.53	2.2073	24 49 45.5	3.573
11	6 19 57.87	2.2041	24 46 7.5	3.693
12	6 22 10.02	2.2008	24 42 22.4	3.812
13	6 24 21.96	2.1973	24 38 30.1	3.930
14	6 26 33.70	2.1939	24 34 30.8	4.048
15	6 28 45.23	2.1904	24 30 24.4	4.165
16	6 30 56.55	2.1868	24 26 11.0	4.281
17	6 33 7.65	2.1833	24 21 50.7	4.397
18	6 35 18.54	2.1797	24 17 23.4	4.512
19	6 37 29.21	2.1760	24 12 49.3	4.626
20	6 39 39.66	2.1723	24 8 8.3	4.740
21	6 41 49.88	2.1685	24 3 20.5	4.853
22	6 43 59.88	2.1648	23 58 26.0	4.964
23	6 46 9.65	2.1609	+23 53 24.8	−5.076
	DECEMBER 11.			
0	6 48 19.19	2.1571	+23 48 16.9	−5.187
1	6 50 28.50	2.1532	23 43 2.4	5.297
2	6 52 37.57	2.1492	23 37 41.3	5.406
3	6 54 46.40	2.1453	23 32 13.7	5.514
4	6 56 55.00	2.1413	23 26 39.6	5.622
5	6 59 3.36	2.1373	23 20 59.1	5.728
6	7 1 11.48	2.1333	23 15 12.2	5.835
7	7 3 19.35	2.1292	23 9 18.9	5.940
8	7 5 26.98	2.1252	23 3 19.4	6.044
9	7 7 34.37	2.1211	22 57 13.6	6.148
10	7 9 41.51	2.1169	22 51 1.6	6.252
11	7 11 48.40	2.1128	22 44 43.4	6.354
12	7 13 55.04	2.1086	22 38 19.1	6.455
13	7 16 1.43	2.1044	22 31 48.8	6.555
14	7 18 7.57	2.1003	22 25 12.5	6.655
15	7 20 13.46	2.0960	22 18 30.2	6.754
16	7 22 19.09	2.0918	22 11 42.0	6.853
17	7 24 24.47	2.0876	22 4 47.9	6.950
18	7 26 29.60	2.0834	21 57 48.0	7.046
19	7 28 34.48	2.0792	21 50 42.4	7.142
20	7 30 39.10	2.0749	21 43 31.0	7.237
21	7 32 43.47	2.0707	21 36 14.0	7.331
22	7 34 47.58	2.0664	21 28 51.3	7.424
23	7 36 51.44	2.0622	21 21 23.1	7.517
24	7 38 55.04	2.0579	+21 13 49.3	−7.608

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min
	DECEMBER 12.			
	h m s	s	° ′ ″	″
0	7 38 55.04	2.0579	+21 13 49.3	−7.608
1	7 40 58.39	2.0537	21 6 10.1	7.698
2	7 43 1.48	2.0494	20 58 25.4	7.788
3	7 45 4.32	2.0453	20 50 35.4	7.878
4	7 47 6.91	2.0410	20 42 40.1	7.966
5	7 49 9.24	2.0368	20 34 39.5	8.053
6	7 51 11.32	2.0326	20 26 33.7	8.140
7	7 53 13.15	2.0284	20 18 22.7	8.227
8	7 55 14.73	2.0242	20 10 6.5	8.312
9	7 57 16.05	2.0200	20 1 45.3	8.396
10	7 59 17.13	2.0158	19 53 19.0	8.479
11	8 1 17.95	2.0117	19 44 47.8	8.561
12	8 3 18.53	2.0076	19 36 11.7	8.643
13	8 5 18.86	2.0034	19 27 30.7	8.724
14	8 7 18.94	1.9993	19 18 44.8	8.804
15	8 9 18.78	1.9953	19 9 54.2	8.883
16	8 11 18.38	1.9913	19 0 58.9	8.961
17	8 13 17.73	1.9872	18 51 58.9	9.039
18	8 15 16.84	1.9832	18 42 54.2	9.117
19	8 17 15.71	1.9793	18 33 44.9	9.193
20	8 19 14.35	1.9753	18 24 31.1	9.268
21	8 21 12.75	1.9713	18 15 12.8	9.342
22	8 23 10.91	1.9674	18 5 50.1	9.415
23	8 25 8.84	1.9635	+17 56 23.0	−9.488
	DECEMBER 13.			
0	8 27 6.53	1.9596	+17 46 51.5	−9.561
1	8 29 3.99	1.9558	17 37 15.7	9.632
2	8 31 1.23	1.9521	17 27 35.7	9.702
3	8 32 58.24	1.9483	17 17 51.5	9.772
4	8 34 55.03	1.9447	17 8 3.1	9.841
5	8 36 51.60	1.9410	16 58 10.6	9.909
6	8 38 47.95	1.9373	16 48 14.0	9.977
7	8 40 44.08	1.9337	16 38 13.4	10.043
8	8 42 39.99	1.9301	16 28 8.9	10.108
9	8 44 35.69	1.9266	16 18 0.4	10.174
10	8 46 31.18	1.9231	16 7 48.0	10.238
11	8 48 26.46	1.9197	15 57 31.8	10.301
12	8 50 21.54	1.9163	15 47 11.9	10.363
13	8 52 16.41	1.9128	15 36 48.2	10.426
14	8 54 11.08	1.9095	15 26 20.8	10.487
15	8 56 5.55	1.9063	15 15 49.8	10.548
16	8 57 59.83	1.9031	15 5 15.1	10.608
17	8 59 53.92	1.8998	14 54 36.9	10.667
18	9 1 47.81	1.8966	14 43 55.1	10.725
19	9 3 41.51	1.8935	14 33 9.9	10.783
20	9 5 35.03	1.8904	14 22 21.2	10.840
21	9 7 28.36	1.8874	14 11 29.1	10.896
22	9 9 21.52	1.8845	14 0 35.7	10.951
23	9 11 14.50	1.8816	13 49 35.0	11.006
24	9 13 7.31	1.8788	+13 38 33.0	−11.060

GREENWICH MEAN TIME.

DECEMBER 14.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	h m s	s	° ′ ″	″
0	9 13 7.31	1.8788	+13 38 33.0	−11.060
1	9 14 59.95	1.8759	13 27 27.8	11.113
2	9 16 52.42	1.8731	13 16 19.4	11.166
3	9 18 44.72	1.8703	13 5 7.9	11.218
4	9 20 36.86	1.8677	12 53 53.3	11.268
5	9 22 28.84	1.8651	12 42 35.7	11.319
6	9 24 20.67	1.8626	12 31 15.0	11.369
7	9 26 12.35	1.8601	12 19 51.4	11.418
8	9 28 3.88	1.8576	12 8 24.8	11.467
9	9 29 55.26	1.8552	11 56 55.4	11.514
10	9 31 46.50	1.8528	11 45 23.1	11.562
11	9 33 37.60	1.8505	11 33 48.0	11.608
12	9 35 28.56	1.8483	11 22 10.2	11.653
13	9 37 19.39	1.8461	11 10 29.6	11.698
14	9 39 10.09	1.8440	10 58 46.4	11.742
15	9 41 0.67	1.8420	10 47 0.6	11.786
16	9 42 51.13	1.8400	10 35 12.1	11.829
17	9 44 41.47	1.8380	10 23 21.1	11.872
18	9 46 31.69	1.8361	10 11 27.5	11.913
19	9 48 21.80	1.8343	9 59 31.5	11.953
20	9 50 11.81	1.8326	9 47 33.1	11.994
21	9 52 1.71	1.8308	9 35 32.2	12.034
22	9 53 51.51	1.8293	9 23 29.0	12.073
23	9 55 41.22	1.8277	+ 9 11 23.4	−12.112

DECEMBER 15.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	h m s	s	° ′ ″	″
0	9 57 30.83	1.8261	+ 8 59 15.6	−12.149
1	9 59 20.35	1.8247	8 47 5.5	12.187
2	10 1 9.79	1.8233	8 34 53.2	12.223
3	10 2 59.14	1.8219	8 22 38.7	12.259
4	10 4 48.42	1.8207	8 10 22.1	12.294
5	10 6 37.62	1.8195	7 58 3.4	12.328
6	10 8 26.76	1.8184	7 45 42.7	12.363
7	10 10 15.83	1.8173	7 33 19.9	12.397
8	10 12 4.83	1.8162	7 20 55.1	12.429
9	10 13 53.77	1.8153	7 8 28.4	12.461
10	10 15 42.66	1.8144	6 55 59.8	12.492
11	10 17 31.50	1.8136	6 43 29.4	12.523
12	10 19 20.29	1.8128	6 30 57.1	12.553
13	10 21 9.04	1.8122	6 18 23.0	12.583
14	10 22 57.75	1.8116	6 5 47.2	12.612
15	10 24 46.43	1.8110	5 53 9.6	12.640
16	10 26 35.07	1.8105	5 40 30.4	12.668
17	10 28 23.69	1.8101	5 27 49.5	12.695
18	10 30 12.28	1.8098	5 15 7.0	12.722
19	10 32 0.86	1.8095	5 2 22.9	12.748
20	10 33 49.42	1.8093	4 49 37.3	12.773
21	10 35 37.98	1.8093	4 36 50.2	12.797
22	10 37 26.53	1.8091	4 24 1.7	12.821
23	10 39 15.07	1.8091	4 11 11.7	12.844
24	10 41 3.62	1.8092	+ 3 58 20.4	−12.866

DECEMBER 16.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	h m s	s	° ′ ″	″
0	10 41 3.62	1.8092	+3 58 20.4	−12.866
1	10 42 52.17	1.8093	3 45 27.8	12.888
2	10 44 40.74	1.8096	3 32 33.8	12.911
3	10 46 29.32	1.8098	3 19 38.5	12.931
4	10 48 17.92	1.8103	3 6 42.1	12.951
5	10 50 6.55	1.8107	2 53 44.4	12.971
6	10 51 55.20	1.8112	2 40 45.6	12.989
7	10 53 43.89	1.8118	2 27 45.7	13.008
8	10 55 32.61	1.8123	2 14 44.7	13.025
9	10 57 21.37	1.8131	2 1 42.7	13.043
10	10 59 10.18	1.8139	1 48 39.6	13.059
11	11 0 59.04	1.8148	1 35 35.6	13.074
12	11 2 47.96	1.8158	1 22 30.7	13.089
13	11 4 36.93	1.8168	1 9 24.9	13.103
14	11 6 25.97	1.8178	0 56 18.3	13.117
15	11 8 15.07	1.8190	0 43 10.9	13.130
16	11 10 4.25	1.8203	0 30 2.7	13.143
17	11 11 53.50	1.8215	0 16 53.8	13.154
18	11 13 42.83	1.8229	+0 3 44.2	13.166
19	11 15 32.25	1.8244	−0 9 26.1	13.176
20	11 17 21.76	1.8260	0 22 36.9	13.185
21	11 19 11.37	1.8276	0 35 48.3	13.195
22	11 21 1.07	1.8293	0 49 0.3	13.203
23	11 22 50.88	1.8311	−1 2 12.7	−13.210

DECEMBER 17.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	h m s	s	° ′ ″	″
0	11 24 40.80	1.8329	−1 15 25.5	−13.217
1	11 26 30.83	1.8348	1 28 38.7	13.223
2	11 28 20.98	1.8368	1 41 52.3	13.229
3	11 30 11.25	1.8389	1 55 6.2	13.233
4	11 32 1.65	1.8411	2 8 20.3	13.238
5	11 33 52.18	1.8433	2 21 34.7	13.242
6	11 35 42.85	1.8457	2 34 49.3	13.244
7	11 37 33.66	1.8481	2 48 4.0	13.246
8	11 39 24.62	1.8506	3 1 18.8	13.248
9	11 41 15.73	1.8531	3 14 33.7	13.248
10	11 43 6.99	1.8557	3 27 48.6	13.248
11	11 44 58.41	1.8584	3 41 3.4	13.246
12	11 46 50.00	1.8613	3 54 18.1	13.244
13	11 48 41.76	1.8641	4 7 32.7	13.242
14	11 50 33.69	1.8670	4 20 47.1	13.238
15	11 52 25.80	1.8701	4 34 1.3	13.234
16	11 54 18.10	1.8732	4 47 15.2	13.229
17	11 56 10.58	1.8763	5 0 28.8	13.223
18	11 58 3.26	1.8797	5 13 42.0	13.217
19	11 59 56.14	1.8830	5 26 54.8	13.209
20	12 1 49.22	1.8864	5 40 7.1	13.201
21	12 3 42.51	1.8899	5 53 18.9	13.193
22	12 5 36.01	1.8935	6 6 30.2	13.183
23	12 7 29.73	1.8973	6 19 40.8	13.171
24	12 9 23.68	1.9010	−6 32 50.7	−13.15[illegible]

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	DECEMBER 18.			
	h m s	s	° ′ ″	″
0	12 9 23.68	1.9010	− 6 32 50.7	−13.159
1	12 11 17.85	1.9048	6 45 59.9	13.147
2	12 13 12.26	1.9088	6 59 8.3	13.133
3	12 15 6.90	1.9127	7 12 15.9	13.119
4	12 17 1.78	1.9168	7 25 22.6	13.104
5	12 18 56.91	1.9210	7 38 28.4	13.088
6	12 20 52.30	1.9253	7 51 33.2	13.071
7	12 22 47.94	1.9295	8 4 36.9	13.053
8	12 24 43.84	1.9339	8 17 39.5	13.034
9	12 26 40.01	1.9384	8 30 41.0	13.014
10	12 28 36.45	1.9430	8 43 41.2	12.993
11	12 30 33.17	1.9477	8 56 40.1	12.971
12	12 32 30.17	1.9523	9 9 37.7	12.948
13	12 34 27.45	1.9572	9 22 33.9	12.924
14	12 36 25.03	1.9621	9 35 28.6	12.899
15	12 38 22.90	1.9670	9 48 21.8	12.873
16	12 40 21.07	1.9721	10 1 13.4	12.847
17	12 42 19.55	1.9773	10 14 3.4	12.819
18	12 44 18.34	1.9824	10 26 51.7	12.790
19	12 46 17.44	1.9877	10 39 38.2	12.759
20	12 48 16.86	1.9931	10 52 22.8	12.728
21	12 50 16.61	1.9986	11 5 5.5	12.696
22	12 52 16.69	2.0041	11 17 46.3	12.663
23	12 54 17.10	2.0097	−11 30 25.0	−12.628
	DECEMBER 19.			
0	12 56 17.85	2.0153	−11 43 1.7	−12.593
1	12 58 18.94	2.0211	11 55 36.1	12.555
2	13 0 20.38	2.0269	12 8 8.3	12.518
3	13 2 22.17	2.0328	12 20 38.2	12.478
4	13 4 24.32	2.0388	12 33 5.7	12.438
5	13 6 26.83	2.0448	12 45 30.7	12.395
6	13 8 29.70	2.0510	12 57 53.1	12.353
7	13 10 32.95	2.0573	13 10 13.0	12.309
8	13 12 36.58	2.0636	13 22 30.2	12.263
9	13 14 40.58	2.0698	13 34 44.6	12.216
10	13 16 44.96	2.0763	13 46 56.1	12.168
11	13 18 49.74	2.0829	13 59 4.7	12.119
12	13 20 54.91	2.0894	14 11 10.4	12.069
13	13 23 0.47	2.0961	14 23 13.0	12.017
14	13 25 6.44	2.1028	14 35 12.4	11.963
15	13 27 12.81	2.1095	14 47 8.6	11.909
16	13 29 19.58	2.1163	14 59 1.5	11.853
17	13 31 26.77	2.1233	15 10 51.0	11.796
18	13 33 34.38	2.1303	15 22 37.0	11.737
19	13 35 42.41	2.1374	15 34 19.4	11.677
20	13 37 50.87	2.1445	15 45 58.2	11.616
21	13 39 59.75	2.1517	15 57 33.3	11.553
22	13 42 9.07	2.1589	16 9 4.5	11.488
23	13 44 18.82	2.1662	16 20 31.9	11.423
24	*13 46 29.01*	*2.1735*	−16 31 55.2	−11.354

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	DECEMBER 20.			
	h m s	s	° ′ ″	″
0	13 46 29.01	2.1735	−16 31 55.2	−11.354
1	13 48 39.64	2.1809	16 43 14.4	11.286
2	13 50 50.72	2.1884	16 54 29.5	11.216
3	13 53 2.25	2.1959	17 5 40.3	11.143
4	13 55 14.23	2.2034	17 16 46.7	11.070
5	13 57 26.66	2.2111	17 27 48.7	10.995
6	13 59 39.56	2.2188	17 38 46.1	10.918
7	14 1 52.92	2.2265	17 49 38.9	10.840
8	14 4 6.74	2.2342	18 0 26.9	10.760
9	14 6 21.02	2.2420	18 11 10.1	10.679
10	14 8 35.78	2.2499	18 21 48.4	10.596
11	14 10 51.01	2.2578	18 32 21.6	10.511
12	14 13 6.71	2.2657	18 42 49.7	10.425
13	14 15 22.89	2.2736	18 53 12.6	10.337
14	14 17 39.54	2.2816	19 3 30.1	10.247
15	14 19 56.68	2.2897	19 13 42.2	10.156
16	14 22 14.30	2.2977	19 23 48.8	10.063
17	14 24 32.40	2.3058	19 33 49.8	9.968
18	14 26 50.99	2.3139	19 43 45.0	9.872
19	14 29 10.07	2.3221	19 53 34.4	9.774
20	14 31 29.64	2.3302	20 3 17.9	9.674
21	14 33 49.69	2.3383	20 12 55.3	9.573
22	14 36 10.23	2.3464	20 22 26.6	9.469
23	14 38 31.26	2.3546	−20 31 51.6	− 9.364
	DECEMBER 21.			
0	14 40 52.78	2.3628	−20 41 10.3	− 9.258
1	14 43 14.79	2.3710	20 50 22.5	9.149
2	14 45 37.30	2.3793	20 59 28.2	9.039
3	14 48 0.30	2.3874	21 8 27.2	8.927
4	14 50 23.79	2.3956	21 17 19.4	8.813
5	14 52 47.77	2.4038	21 26 4.7	8.698
6	14 55 12.24	2.4119	21 34 43.1	8.581
7	14 57 37.20	2.4201	21 43 14.4	8.461
8	15 0 2.65	2.4283	21 51 38.4	8.339
9	15 2 28.59	2.4363	21 59 55.1	8.218
10	15 4 55.01	2.4444	22 8 4.5	8.093
11	15 7 21.92	2.4525	22 16 6.3	7.967
12	15 9 49.31	2.4606	22 24 0.5	7.839
13	15 12 17.19	2.4686	22 31 47.0	7.709
14	15 14 45.54	2.4765	22 39 25.6	7.578
15	15 17 14.37	2.4844	22 46 56.3	7.444
16	15 19 43.67	2.4923	22 54 18.9	7.308
17	15 22 13.45	2.5002	23 1 33.3	7.172
18	15 24 43.69	2.5079	23 8 39.5	7.033
19	15 27 14.40	2.5157	23 15 37.3	6.893
20	15 29 45.57	2.5233	23 22 26.6	6.751
21	15 32 17.20	2.5310	23 29 7.4	6.608
22	15 34 49.29	2.5385	23 35 39.5	6.462
23	15 37 21.82	2.5459	23 42 2.8	6.314
24	15 39 54.80	2.5533	−23 48 17.2	− 6.165

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	DECEMBER 22.			
	h m s	s	° ′ ″	″
0	15 39 54.80	2.5533	−23 48 17.2	−6.165
1	15 42 28.22	2.5607	23 54 22.6	6.015
2	15 45 2.08	2.5679	24 0 19.0	5.863
3	15 47 36.37	2.5750	24 6 6.2	5.709
4	15 50 11.08	2.5820	24 11 44.1	5.553
5	15 52 46.21	2.5890	24 17 12.6	5.397
6	15 55 21.76	2.5959	24 22 31.7	5.238
7	15 57 57.72	2.6027	24 27 41.2	5.078
8	16 0 34.08	2.6093	24 32 41.0	4.916
9	16 3 10.83	2.6158	24 37 31.1	4.753
10	16 5 47.97	2.6222	24 42 11.3	4.588
11	16 8 25.49	2.6285	24 46 41.6	4.422
12	16 11 3.39	2.6348	24 51 1.9	4.254
13	16 13 41.66	2.6408	24 55 12.1	4.085
14	16 16 20.28	2.6467	24 59 12.1	3.914
15	16 18 59.26	2.6525	25 3 1.8	3.742
16	16 21 38.58	2.6582	25 6 41.1	3.568
17	16 24 18.24	2.6637	25 10 10.0	3.394
18	16 26 58.22	2.6690	25 13 28.4	3.219
19	16 29 38.52	2.6743	25 16 36.3	3.043
20	16 32 19.13	2.6793	25 19 33.5	2.864
21	16 35 0.04	2.6843	25 22 20.0	2.685
22	16 37 41.24	2.6890	25 24 55.7	2.504
23	16 40 22.72	2.6937	−25 27 20.5	−2.323
	DECEMBER 23.			
0	16 43 4.48	2.6982	−25 29 34.4	−2.140
1	16 45 46.50	2.7024	25 31 37.3	1.957
2	16 48 28.77	2.7065	25 33 29.2	1.773
3	16 51 11.28	2.7104	25 35 10.0	1.587
4	16 53 54.02	2.7142	25 36 39.6	1.400
5	16 56 36.98	2.7178	25 37 58.0	1.213
6	16 59 20.15	2.7212	25 39 5.1	1.025
7	17 2 3.52	2.7244	25 40 1.0	0.837
8	17 4 47.08	2.7275	25 40 45.5	0.647
9	17 7 30.82	2.7304	25 41 18.6	0.457
10	17 10 14.73	2.7332	25 41 40.3	0.267
11	17 12 58.80	2.7357	25 41 50.6	−0.076
12	17 15 43.01	2.7379	25 41 49.4	+0.116
13	17 18 27.35	2.7401	25 41 36.7	0.308
14	17 21 11.82	2.7420	25 41 12.4	0.502
15	17 23 56.39	2.7437	25 40 36.5	0.695
16	17 26 41.06	2.7453	25 39 49.0	0.888
17	17 29 25.82	2.7467	25 38 50.0	1.081
18	17 32 10.66	2.7478	25 37 39.3	1.275
19	17 34 55.56	2.7488	25 36 17.0	1.468
20	17 37 40.52	2.7496	25 34 43.1	1.663
21	17 40 25.51	2.7502	25 32 57.5	1.857
22	17 43 10.54	2.7507	25 31 0.3	2.050
23	17 45 55.59	2.7508	25 28 51.5	2.244
24	17 48 40.64	2.7508	−25 26 31.0	+2.438

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	DECEMBER 24.			
	h m s	s	° ′ ″	″
0	17 48 40.64	2.7508	−25 26 31.0	+ 2.438
1	17 51 25.69	2.7506	25 23 58.9	2.633
2	17 54 10.71	2.7501	25 21 15.1	2.827
3	17 56 55.70	2.7496	25 18 19.7	3.019
4	17 59 40.66	2.7489	25 15 12.8	3.212
5	18 2 25.57	2.7479	25 11 54.3	3.405
6	18 5 10.41	2.7468	25 8 24.2	3.598
7	18 7 55.18	2.7455	25 4 42.6	3.789
8	18 10 39.87	2.7440	25 0 49.5	3.980
9	18 13 24.46	2.7423	24 56 45.0	4.170
10	18 16 8.94	2.7404	24 52 29.1	4.360
11	18 18 53.31	2.7384	24 48 1.8	4.550
12	18 21 37.55	2.7362	24 43 23.1	4.739
13	18 24 21.65	2.7338	24 38 33.1	4.927
14	18 27 5.60	2.7312	24 33 31.9	5.113
15	18 29 49.39	2.7284	24 28 19.5	5.300
16	18 32 33.01	2.7255	24 22 55.9	5.485
17	18 35 16.45	2.7224	24 17 21.3	5.669
18	18 37 59.70	2.7192	24 11 35.6	5.853
19	18 40 42.75	2.7158	24 5 38.9	6.036
20	18 43 25.59	2.7123	23 59 31.3	6.217
21	18 46 8.22	2.7086	23 53 12.9	6.397
22	18 48 50.62	2.7048	23 46 43.7	6.576
23	18 51 32.79	2.7008	−23 40 3.8	+ 6.753
	DECEMBER 25.			
0	18 54 14.71	2.6966	−23 33 13.3	+ 6.930
1	18 56 56.38	2.6923	23 26 12.2	7.105
2	18 59 37.78	2.6878	23 19 0.7	7.278
3	19 2 18.92	2.6833	23 11 38.8	7.451
4	19 4 59.78	2.6787	23 4 6.6	7.623
5	19 7 40.36	2.6738	22 56 24.1	7.793
6	19 10 20.64	2.6689	22 48 31.5	7.960
7	19 13 0.63	2.6639	22 40 28.9	8.127
8	19 15 40.31	2.6588	22 32 16.3	8.292
9	19 18 19.68	2.6535	22 23 53.9	8.455
10	19 20 58.73	2.6481	22 15 21.7	8.618
11	19 23 37.45	2.6426	22 6 39.8	8.778
12	19 26 15.84	2.6370	21 57 48.4	8.936
13	19 28 53.89	2.6313	21 48 47.5	9.093
14	19 31 31.60	2.6257	21 39 37.3	9.248
15	19 34 8.97	2.6198	21 30 17.8	9.402
16	19 36 45.98	2.6138	21 20 49.1	9.553
17	19 39 22.63	2.6078	21 11 11.4	9.703
18	19 41 58.92	2.6018	21 1 24.8	9.851
19	19 44 34.85	2.5958	20 51 29.3	9.998
20	19 47 10.41	2.5895	20 41 25.1	10.142
21	19 49 45.59	2.5832	20 31 12.3	10.283
22	19 52 20.39	2.5768	20 20 51.1	10.424
23	19 54 54.81	2.5705	20 10 21.4	10.563
24	19 57 28.85	2.5641	−19 59 43.5	+10.[illegible]

MOON, 1916.

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	DECEMBER 26.					**DECEMBER 28.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	19 57 28.85	2.5641	−19 59 43.5	+10.699	0	21 52 58.45	2.2578	−9 27 7.8	+14.886
1	20 0 2.50	2.5576	19 48 57.5	10.834	1	21 55 13.76	2.2525	9 12 13.5	14.925
2	20 2 35.76	2.5510	19 38 3.4	10.968	2	21 57 28.75	2.2473	8 57 16.8	14.963
3	20 5 8.62	2.5444	19 27 1.4	11.098	3	21 59 43.43	2.2420	8 42 17.9	14.998
4	20 7 41.09	2.5379	19 15 51.7	11.226	4	22 1 57.79	2.2368	8 27 17.0	15.032
5	20 10 13.17	2.5313	19 4 34.3	11.353	5	22 4 11.85	2.2318	8 12 14.1	15.064
6	20 12 44.84	2.5246	18 53 9.3	11.478	6	22 6 25.61	2.2269	7 57 9.3	15.095
7	20 15 16.12	2.5179	18 41 36.9	11.601	7	22 8 39.08	2.2220	7 42 2.7	15.124
8	20 17 46.99	2.5112	18 29 57.2	11.721	8	22 10 52.25	2.2172	7 26 54.4	15.151
9	20 20 17.46	2.5045	18 18 10.4	11.839	9	22 13 5.14	2.2124	7 11 44.6	15.176
10	20 22 47.53	2.4978	18 6 16.5	11.957	10	22 15 17.74	2.2078	6 56 33.3	15.200
11	20 25 17.19	2.4909	17 54 15.6	12.072	11	22 17 30.07	2.2032	6 41 20.6	15.222
12	20 27 46.44	2.4842	17 42 7.9	12.184	12	22 19 42.12	2.1986	6 26 6.7	15.242
13	20 30 15.29	2.4774	17 29 53.5	12.294	13	22 21 53.90	2.1942	6 10 51.6	15.261
14	20 32 43.73	2.4707	17 17 32.6	12.403	14	22 24 5.42	2.1898	5 55 35.4	15.278
15	20 35 11.77	2.4639	17 5 5.2	12.509	15	22 26 16.68	2.1856	5 40 18.3	15.293
16	20 37 39.40	2.4571	16 52 31.5	12.613	16	22 28 27.69	2.1814	5 25 0.3	15.307
17	20 40 6.62	2.4503	16 39 51.6	12.716	17	22 30 38.45	2.1773	5 9 41.5	15.319
18	20 42 33.44	2.4437	16 27 5.6	12.816	18	22 32 48.96	2.1732	4 54 22.0	15.330
19	20 44 59.86	2.4369	16 14 13.7	12.913	19	22 34 59.23	2.1693	4 39 1.9	15.339
20	20 47 25.87	2.4302	16 1 16.0	13.009	20	22 37 9.27	2.1654	4 23 41.3	15.348
21	20 49 51.48	2.4235	15 48 12.6	13.103	21	22 39 19.08	2.1616	4 8 20.2	15.353
22	20 52 16.69	2.4168	15 35 3.6	13.196	22	22 41 28.66	2.1578	3 52 58.9	15.358
23	20 54 41.50	2.4102	−15 21 49.1	+13.286	23	22 43 38.02	2.1542	−3 37 37.3	+15.361
	DECEMBER 27.					**DECEMBER 29.**			
0	20 57 5.91	2.4035	−15 8 29.3	+13.373	0	22 45 47.16	2.1506	−3 22 15.6	+15.363
1	20 59 29.92	2.3969	14 55 4.3	13.459	1	22 47 56.09	2.1472	3 6 53.8	15.363
2	21 1 53.54	2.3904	14 41 34.2	13.543	2	22 50 4.82	2.1438	2 51 32.1	15.361
3	21 4 16.77	2.3839	14 27 59.1	13.625	3	22 52 13.35	2.1406	2 36 10.5	15.358
4	21 6 39.61	2.3774	14 14 19.2	13.704	4	22 54 21.69	2.1373	2 20 49.2	15.353
5	21 9 2.06	2.3709	14 0 34.6	13.782	5	22 56 29.83	2.1341	2 5 28.1	15.348
6	21 11 24.12	2.3644	13 46 45.4	13.858	6	22 58 37.78	2.1311	1 50 7.4	15.342
7	21 13 45.79	2.3580	13 32 51.7	13.932	7	23 0 45.56	2.1282	1 34 47.1	15.333
8	21 16 7.08	2.3518	13 18 53.6	14.003	8	23 2 53.16	2.1252	1 19 27.4	15.323
9	21 18 28.00	2.3455	13 4 51.3	14.073	9	23 5 0.58	2.1223	1 4 8.4	15.311
10	21 20 48.54	2.3393	12 50 44.9	14.140	10	23 7 7.84	2.1197	0 48 50.1	15.298
11	21 23 8.71	2.3330	12 36 34.5	14.206	11	23 9 14.94	2.1171	0 33 32.6	15.285
12	21 25 28.50	2.3268	12 22 20.2	14.270	12	23 11 21.89	2.1145	0 18 15.9	15.270
13	21 27 47.93	2.3208	12 8 2.1	14.332	13	23 13 28.68	2.1120	−0 3 0.2	15.253
14	21 30 7.00	2.3148	11 53 40.4	14.391	14	23 15 35.33	2.1097	+0 12 14.5	15.236
15	21 32 25.70	2.3088	11 39 15.2	14.448	15	23 17 41.84	2.1073	0 27 28.1	15.217
16	21 34 44.05	2.3029	11 24 46.6	14.505	16	23 19 48.21	2.1050	0 42 40.5	15.196
17	21 37 2.05	2.2971	11 10 14.6	14.560	17	23 21 54.44	2.1028	0 57 51.6	15.174
18	21 39 19.70	2.2913	10 55 39.4	14.612	18	23 24 0.55	2.1008	1 13 1.4	15.151
19	21 41 37.00	2.2855	10 41 1.2	14.662	19	23 26 6.54	2.0988	1 28 9.7	15.127
20	21 43 53.96	2.2798	10 26 20.0	14.710	20	23 28 12.41	2.0969	1 43 16.6	15.102
21	21 46 10.58	2.2743	10 11 36.0	14.757	21	23 30 18.17	2.0951	1 58 21.9	15.074
22	21 48 26.87	2.2687	9 56 49.2	14.802	22	23 32 23.82	2.0933	2 13 25.5	15.047
23	21 50 42.82	2.2632	9 41 59.8	14.845	23	23 34 29.37	2.0917	2 28 27.5	15.018
24	*21 52 58.54*	*2.2578*	− 9 27 7.8	+14.886	24	23 36 34.82	2.0901	+2 43 27.7	+14.988

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	DECEMBER 30.					DECEMBER 31.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	23 36 34.82	2.0901	+2 43 27.7	+14.988	0	0 26 28.15	2.0744	+ 8 31 39.2	+13.924
1	23 38 40.18	2.0886	2 58 26.0	14.956	1	0 28 32.62	2.0746	8 45 32.9	13.867
2	23 40 45.45	2.0871	3 13 22.4	14.923	2	0 30 37.10	2.0748	8 59 23.2	13.808
3	23 42 50.63	2.0858	3 28 16.8	14.889	3	0 32 41.60	2.0753	9 13 9.9	13.749
4	23 44 55.74	2.0845	3 43 9.1	14.854	4	0 34 46.13	2.0758	9 26 53.1	13.689
5	23 47 0.77	2.0833	3 57 59.3	14.818	5	0 36 50.69	2.0762	9 40 32.6	13.628
6	23 49 5.73	2.0822	4 12 47.3	14.781	6	0 38 55.27	2.0767	9 54 8.4	13.565
7	23 51 10.63	2.0811	4 27 33.0	14.743	7	0 40 59.89	2.0773	10 7 40.4	13.502
8	23 53 15.46	2.0801	4 42 16.4	14.703	8	0 43 4.55	2.0780	10 21 8.6	13.438
9	23 55 20.24	2.0792	4 56 57.4	14.663	9	0 45 9.25	2.0787	10 34 33.0	13.373
10	23 57 24.96	2.0783	5 11 35.9	14.621	10	0 47 13.99	2.0794	10 47 53.4	13.307
11	23 59 29.64	2.0777	5 26 11.9	14.578	11	0 49 18.78	2.0803	11 1 9.8	13.240
12	0 1 34.28	2.0770	5 40 45.3	14.534	12	0 51 23.63	2.0813	11 14 22.2	13.173
13	0 3 38.88	2.0763	5 55 16.0	14.488	13	0 53 28.53	2.0822	11 27 30.5	13.103
14	0 5 43.44	2.0758	6 9 43.9	14.443	14	0 55 33.49	2.0832	11 40 34.6	13.033
15	0 7 47.98	2.0754	6 24 9.1	14.396	15	0 57 38.51	2.0843	11 53 34.5	12.963
16	0 9 52.49	2.0749	6 38 31.4	14.347	16	0 59 43.60	2.0854	12 6 30.1	12.891
17	0 11 56.97	2.0746	6 52 50.7	14.298	17	1 1 48.76	2.0866	12 19 21.4	12.818
18	0 14 1.44	2.0744	7 7 7.1	14.248	18	1 3 53.99	2.0878	12 32 8.3	12.745
19	0 16 5.90	2.0743	7 21 20.4	14.196	19	1 5 59.30	2.0891	12 44 50.8	12.671
20	0 18 10.35	2.0742	7 35 30.6	14.144	20	1 8 4.68	2.0903	12 57 28.8	12.596
21	0 20 14.80	2.0741	7 49 37.7	14.091	21	1 10 10.14	2.0918	13 10 2.3	12.520
22	0 22 19.24	2.0741	8 3 41.5	14.036	22	1 12 15.69	2.0933	13 22 31.2	12.443
23	0 24 23.69	2.0743	8 17 42.0	13.981	23	1 14 21.33	2.0947	13 34 55.4	12.364
24	0 26 28.15	2.0744	+8 31 39.2	+13.924	24	1 16 27.05	2.0961	+13 47 14.9	+12.285

PHASES OF THE MOON.

		d h m		d h m		d h m		d h m
● New Moon	Jan.	4 16 45.4	Apr.	2 4 21.2	June	29 22 43.4	Sept.	26 19 34.1
☽ First Quarter		11 15 37.6		10 2 35.7	July	7 23 55.0	Oct.	3 23 0.5
○ Full Moon		19 20 29.0		17 17 7.5		14 16 40.0		10 19 1.1
☾ Last Quarter		27 12 35.1		24 10 38.3		21 11 33.0		18 13 8.7
● New Moon	Feb.	3 4 5.6	May	1 17 28.9		29 14 15.4		26 8 37.0
☽ First Quarter		10 10 20.4		9 20 47.1	Aug.	6 9 5.6	Nov.	2 5 50.6
○ Full Moon		18 14 28.6		17 2 11.3		13 0 0.3		9 8 18.0
☾ Last Quarter		25 21 23.8		23 17 16.4		20 0 52.8		17 10 0.5
● New Moon	Mar.	3 15 57.6		31 7 37.3		28 5 24.7		24 20 50.4
☽ First Quarter		11 6 32.9	June	8 11 59.0	Sept.	4 16 26.5	Dec.	1 13 55.5
○ Full Moon		19 5 26.7		15 9 41.7		11 8 30.9		9 0 43.9
☾ Last Quarter		26 4 22.4		22 1 16.3		18 17 35.3		17 6 6.4
● New Moon	Apr.	2 4 21.2		29 22 43.4		26 19 34.1		24 8 31.2
☽ First Quarter		10 2 35.7	July	7 23 55.0	Oct.	3 23 0.5		31 0 7.2

APOGEE.

	d h		d h
		June	30 16.2
January	16 17.1	July	27 19.5
February	13 9.4	August	24 5.0
March	12 5.4	September	20 21.6
April	9 1.7	October	18 17.2
May	6 19.7	November	15 14.0
June	*3 9.5*	*December*	*13 8.8*

PERIGEE.

	d h		d h
January	4 2.3	July	14 12.3
February	1 12.1	August	11 21.3
February	29 8.7	September	9 1.4
March	26 1.2	October	6 10.5
April	20 23.6	October	31 6.8
May	18 20.0	November	27 7.[illegible]
June	16 2.6	December	25 [illegible]

MOON, 1916.

GREENWICH MEAN TIME.

G. M. T.		Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.				Var. per Hour.
		° ′ ″	° ′ ″	′ ″	′ ″	″	d				h m	m
Jan.	1.0	227 54 17.5	−5 9 8.9	16 21.5	59 56.21	+1.989	25.7	Jan.	1	L	8 36.8	2.52
	1.5	235 13 54.7	5 0 2.5	16 27.7	60 18.98	1.795	26.2		1	U	21 7.7	2.63
	2.0	242 38 55.3	4 45 49.7	16 33.2	60 39.07	1.544	26.7		2	L	9 39.9	2.72
	2.5	250 8 30.3	4 26 35.6	16 37.7	60 55.81	1.238	27.2		2	U	22 12.9	2.78
	3.0	257 41 39.5	4 2 34.3	16 41.2	61 8.58	0.884	27.7		3	L	10 46.5	2.81
	3.5	265 17 14.5	−3 34 8.2	16 43.5	61 16.87	+0.493	28.2		3	U	23 20.1	2.79
	4.0	272 54 0.7	3 1 48.1	16 44.4	61 20.30	+0.079	28.7		4	L	11 53.2	2.73
	4.5	280 30 40.8	2 26 12.7	16 44.0	61 18.73	−0.344	29.2				. . . . .	. . .
	5.0	288 5 56.9	1 48 6.2	16 42.2	61 12.09	0.760	0.3		5	U	0 25.5	2.65
	5.5	295 38 35.1	1 8 17.0	16 39.0	61 0.59	1.152	0.8		5	L	12 56.7	2.54
	6.0	303 7 27.9	−0 27 34.6	16 34.7	60 44.59	−1.506	1.3		6	U	1 26.5	2.43
	6.5	310 31 36.4	+0 13 12.1	16 29.2	60 24.65	1.811	1.8		6	L	13 55.0	2.32
	7.0	317 50 12.1	0 53 16.6	16 22.9	60 1.35	2.060	2.3		7	U	2 22.1	2.21
	7.5	325 2 37.2	1 31 57.4	16 15.8	59 35.45	2.249	2.8		7	L	14 48.1	2.11
	8.0	332 8 26.3	2 8 37.5	16 8.3	59 7.65	2.375	3.3		8	U	3 12.9	2.03
	8.5	339 7 24.5	+2 42 46.7	16 0.4	58 38.71	−2.441	3.8		8	L	15 36.8	1.96
	9.0	345 59 27.4	3 14 0.3	15 52.4	58 9.29	2.452	4.3		9	U	4 0.0	1.91
	9.5	352 44 39.7	3 41 59.4	15 44.4	57 40.05	2.413	4.8		9	L	16 22.7	1.87
	10.0	359 23 14.1	4 6 30.6	15 36.6	57 11.52	2.332	5.3		10	U	4 45.0	1.85
	10.5	5 55 29.5	4 27 24.4	15 29.2	56 44.23	2.215	5.8		10	L	17 7.0	1.84
	11.0	12 21 49.6	+4 44 35.5	15 22.2	56 18.49	−2.071	6.3		11	U	5 29.1	1.84
	11.5	18 42 42.2	4 58 1.8	15 15.6	55 54.60	1.905	6.8		11	L	17 51.2	1.85
	12.0	24 58 37.6	5 7 43.2	15 9.7	55 32.85	1.722	7.3		12	U	6 13.4	1.87
	12.5	31 10 7.5	5 13 42.1	15 4.4	55 13.32	1.530	7.8		12	L	18 36.0	1.90
	13.0	37 17 44.9	5 16 1.8	14 59.7	54 56.13	1.333	8.3		13	U	6 58.9	1.93
	13.5	43 22 2.0	+5 14 47.5	14 55.7	54 41.31	−1.135	8.8		13	L	19 22.3	1.97
	14.0	49 23 30.9	5 10 4.9	14 52.3	54 28.89	0.938	9.3		14	U	7 46.1	2.01
	14.5	55 22 42.9	5 2 1.0	14 49.5	54 18.79	0.746	9.8		14	L	20 10.4	2.04
	15.0	61 20 7.4	4 50 43.5	14 47.4	54 10.95	0.561	10.3		15	U	8 35.1	2.08
	15.5	67 16 12.7	4 36 20.8	14 45.9	54 5.28	0.386	10.8		15	L	21 0.2	2.10
	16.0	73 11 25.0	+4 19 2.6	14 44.9	54 1.65	−0.221	11.3		16	U	9 25.5	2.12
	16.5	79 6 8.7	3 58 59.2	14 44.4	53 59.93	−0.067	11.8		16	L	21 50.9	2.12
	17.0	85 0 46.4	3 36 22.2	14 44.4	54 0.01	+0.076	12.3		17	U	10 16.3	2.11
	17.5	90 55 38.2	3 11 24.6	14 44.9	54 1.72	0.207	12.8		17	L	22 41.5	2.09
	18.0	96 51 3.2	2 44 20.2	14 45.8	54 4.94	0.327	13.3		18	U	11 6.5	2.07
	18.5	102 47 18.7	+2 15 24.4	14 47.0	54 9.54	+0.437	13.8		18	L	23 31.1	2.03
	19.0	108 44 40.6	1 44 53.7	14 48.6	54 15.41	0.538	14.3		19	U	11 55.2	1.99
	19.5	114 43 23.2	1 13 6.0	14 50.5	54 22.42	0.630	14.8				. . . . .	. . .
	20.0	120 43 40.5	0 40 20.5	14 52.7	54 30.51	0.716	15.3		20	L	0 18.8	1.95
	20.5	126 45 45.4	+0 6 57.3	14 55.2	54 39.59	0.796	15.8		20	U	12 41.9	1.90
	21.0	132 49 50.6	−0 26 42.4	14 57.9	54 49.61	+0.872	16.3		21	L	1 4.5	1.86
	21.5	138 56 8.3	1 0 16.4	15 0.9	55 0.52	0.947	16.8		21	U	13 26.6	1.83
	22.0	145 4 51.3	1 33 22.1	15 4.1	55 12.34	1.021	17.3		22	L	1 48.4	1.80
	22.5	151 16 12.4	2 5 36.4	15 7.6	55 25.03	1.095	17.8		22	U	14 9.9	1.78
	23.0	157 30 24.7	2 36 35.9	15 11.3	55 38.61	1.170	18.3		23	L	2 31.2	1.77
	23.5	163 47 42.0	−3 5 57.2	15 15.2	55 53.11	+1.247	18.8		23	U	14 52.5	1.77
	24.0	170 8 18.7	−3 33 16.9	15 19.4	56 8.54	+1.324	19.3		24	L	3 13.8	1.78

GREENWICH MEAN TIME.

G. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.			Var. per Hour.
	° ′ ″	° ′ ″	′ ″	′ ″	″	d			h m	m
n. 24.0	170 8 18.7	−3 33 16.9	15 19.4	56 8.54	+1.324	19.3	Jan. 24	L	3 13.8	1.78
24.5	176 32 29.5	3 58 12.2	15 23.9	56 24.88	1.401	19.8	24	U	15 35.4	1.81
25.0	183 0 29.3	4 20 20.9	15 28.6	56 42.14	1.477	20.3	25	L	3 57.3	1.84
25.5	189 32 33.0	4 39 21.2	15 33.6	57 0.31	1.550	20.8	25	U	16 19.7	1.90
26.0	196 8 54.5	4 54 53.0	15 38.7	57 19.31	1.615	21.3	26	L	4 42.9	1.97
26.5	202 49 47.0	−5 6 37.0	15 44.1	57 39.04	+1.670	21.8	26	U	17 6.9	2.04
27.0	209 35 21.4	5 14 16.0	15 49.6	57 59.34	1.711	22.3	27	L	5 31.9	2.13
27.5	216 25 46.0	5 17 35.0	15 55.3	58 20.01	1.732	22.8	27	U	17 58.0	2.22
28.0	223 21 5.3	5 16 21.8	16 0.9	58 40.79	1.727	23.3	28	L	6 25.3	2.33
28.5	230 21 19.3	5 10 27.8	16 6.5	59 1.32	1.691	23.8	28	U	18 54.0	2.43
29.0	237 26 22.3	−4 59 48.2	16 12.0	59 21.23	+1.620	24.3	29	L	7 23.8	2.52
29.5	244 36 2.6	4 44 23.4	16 17.1	59 40.07	1.510	24.8	29	U	19 54.7	2.61
30.0	251 50 1.2	4 24 19.6	16 21.8	59 57.33	1.358	25.3	30	L	8 26.5	2.67
30.5	259 7 51.7	3 59 49.1	16 25.9	60 12.47	1.161	25.8	30	U	20 58.9	2.71
31.0	266 29 0.2	3 31 11.0	16 29.3	60 25.02	0.922	26.3	31	L	9 31.4	2.69
31.5	273 52 45.3	−2 58 51.3	16 31.9	60 34.46	+0.645	26.8	31	U	22 3.6	2.66
'eb. 1.0	281 18 19.1	2 23 22.5	16 33.5	60 40.36	+0.335	27.3	Feb. 1	L	10 35.3	2.60
1.5	288 44 48.5	1 45 22.8	16 34.1	60 42.40	0.000	27.8	1	U	23 6.1	2.52
2.0	296 11 16.4	1 5 35.7	16 33.5	60 40.32	−0.347	28.3	2	L	11 35.8	2.42
2.5	203 36 44.1	−0 24 47.1	16 31.8	60 34.08	0.694	28.8			.....	...
3.0	311 0 12.8	+0 16 15.5	16 29.0	60 23.72	−1.028	29.3	3	U	0 4.3	2.33
3.5	318 20 46.4	0 56 45.3	16 25.1	60 9.49	1.339	0.3	3	L	12 31.7	2.24
4.0	325 37 32.1	1 35 57.7	16 20.3	59 51.71	1.616	0.8	4	U	0 58.1	2.15
4.5	332 49 44.1	2 13 12.4	16 14.6	59 30.87	1.850	1.3	4	L	13 23.4	2.07
5.0	339 56 43.3	2 47 54.3	16 8.2	59 7.52	2.033	1.8	5	U	1 47.9	2.02
5.5	346 57 59.2	+3 19 34.1	16 1.4	58 42.30	−2.164	2.3	5	L	14 11.8	1.97
6.0	353 53 10.0	3 47 49.2	15 54.1	58 15.78	2.242	2.8	6	U	2 35.2	1.93
6.5	0 42 2.9	4 12 22.6	15 46.7	57 48.68	2.271	3.3	6	L	14 58.2	1.91
7.0	7 24 33.6	4 33 2.7	15 39.3	57 21.49	2.252	3.8	7	U	3 21.0	1.90
7.5	14 0 46.0	4 49 44.1	15 32.1	56 54.83	2.188	4.3	7	L	15 43.7	1.90
8.0	20 30 51.2	+5 2 24.8	15 25.1	56 29.16	−2.085	4.8	8	U	4 6.5	1.90
8.5	26 55 7.1	5 11 6.4	15 18.5	56 4.91	1.950	5.3	8	L	16 29.4	1.92
9.0	33 13 56.4	5 15 53.3	15 12.3	55 42.45	1.790	5.8	9	U	4 52.6	1.95
9.5	39 27 46.5	5 16 52.1	15 6.8	55 22.02	1.610	6.3	9	L	17 16.2	1.98
10.0	45 37 8.0	5 14 10.7	15 1.8	55 3.87	1.414	6.8	10	U	5 40.1	2.00
10.5	51 42 34.3	+5 7 58.0	14 57.5	54 48.13	−1.207	7.3	10	L	18 4.3	2.03
11.0	57 44 40.0	4 58 23.8	14 53.9	54 34.92	0.994	7.8	11	U	6 29.0	2.07
11.5	63 44 1.2	4 45 38.5	14 51.0	54 24.30	0.779	8.3	11	L	18 53.9	2.09
12.0	69 41 14.2	4 29 52.7	14 48.8	54 16.23	0.565	8.8	12	U	7 19.1	2.11
12.5	75 36 54.8	4 11 17.6	14 47.3	54 10.71	0.355	9.3	12	L	19 44.5	2.12
13.0	81 31 38.1	+3 50 4.9	14 46.5	54 7.69	−0.152	9.8	13	U	8 9.9	2.12
13.5	87 25 58.6	3 26 26.6	14 46.3	54 7.03	+0.041	10.3	13	L	20 35.2	2.10
14.0	93 20 28.8	3 0 35.9	14 46.8	54 8.63	0.222	10.8	14	U	9 0.4	2.08
14.5	99 15 39.6	2 32 46.5	14 47.8	54 12.31	0.390	11.3	14	L	21 25.2	2.06
15.0	105 11 59.4	2 3 13.1	14 49.3	54 17.94	0.544	11.8	15	U	9 49.7	2.02
15.5	111 9 54.8	+1 32 11.9	14 51.3	54 25.32	+0.683	12.3	15	L	22 13.7	1.98
16.0	117 9 49.5	+1 0 0.2	14 53.8	54 34.26	+0.805	12.8	16	U	10 37.3	1.94

MOON, 1916.

GREENWICH MEAN TIME.

G. M. T.		Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.				Var. per Hour.
		° ′ ″	° ′ ″	′ ″	′ ″	″	d				h m	m
Feb.	16.0	117 9 49.5	+1 0 0.2	14 53.8	54 34.26	+0.805	12.8	Feb.	16	U	10 37.3	1.94
	16.5	123 12 4.7	+0 26 56.6	14 56.6	54 44.56	0.909	13.3		16	L	23 0.4	1.90
	17.0	129 16 58.6	−0 6 38.5	14 59.7	54 56.00	0.997	13.8		17	U	11 23.0	1.87
	17.5	135 24 46.7	0 40 23.6	15 3.1	55 8.42	1.068	14.3		17	L	23 45.3	1.84
	18.0	141 35 41.6	1 13 55.8	15 6.6	55 21.59	1.124	14.8		18	U	12 7.3	1.82
	18.5	147 49 52.8	−1 46 51.0	15 10.4	55 35.33	+1.166	15.3				. . . . .	. . .
	19.0	154 7 27.2	2 18 44.6	15 14.3	55 49.53	1.195	15.8		19	L	0 29.0	1.81
	19.5	160 28 29.1	2 49 11.0	15 18.2	56 3.96	1.212	16.3		19	U	12 50.7	1.80
	20.0	166 53 0.6	3 17 45.0	15 22.2	56 18.57	1.220	16.8		20	L	1 12.3	1.81
	20.5	173 21 1.4	3 44 1.4	15 26.2	56 33.22	1.221	17.3		20	U	13 34.1	1.82
	21.0	179 52 29.4	−4 7 36.0	15 30.2	56 47.84	+1.215	17.8		21	L	1 56.1	1.85
	21.5	186 27 21.5	4 28 5.7	15 34.1	57 2.36	1.205	18.3		21	U	14 18.5	1.88
	22.0	193 5 32.9	4 45 9.6	15 38.0	57 16.75	1.193	18.8		22	L	2 41.4	1.93
	22.5	199 46 58.3	4 58 28.7	15 41.9	57 31.00	1.180	19.3		22	U	15 5.0	2.00
	23.0	206 31 32.6	5 7 46.9	15 45.8	57 45.06	1.164	19.8		23	L	3 29.5	2.07
	23.5	213 19 9.4	−5 12 51.0	15 49.5	57 58.89	+1.145	20.3		23	U	15 54.8	2.15
	24.0	220 9 43.0	5 13 31.4	15 53.2	58 12.49	1.121	20.8		24	L	4 21.2	2.24
	24.5	227 3 7.4	5 9 41.9	15 56.8	58 25.78	1.092	21.3		24	U	16 48.6	2.33
	25.0	233 59 16.0	5 1 20.6	16 0.4	58 38.70	1.057	21.8		25	L	5 17.1	2.42
	25.5	240 58 2.3	4 48 29.7	16 3.8	58 51.12	1.010	22.3		25	U	17 46.6	2.49
	26.0	247 59 18.6	−4 31 15.6	16 7.0	59 2.87	+0.949	22.8		26	L	6 16.9	2.55
	26.5	255 2 56.2	4 9 49.8	16 9.9	59 13.81	0.870	23.3		26	U	18 47.8	2.59
	27.0	262 8 44.5	3 44 28.0	16 12.6	59 23.69	0.772	23.8		27	L	7 19.1	2.60
	27 5	269 16 30.9	3 15 31.0	16 15.0	59 32.27	0.652	24.3		27	U	19 50.3	2.59
	28.0	276 25 59.2	2 43 24.0	16 16.9	59 39.24	0.508	24.8		28	L	8 21.3	2.55
	28.5	283 36 50.8	−2 8 36.5	16 18.3	59 44.39	+0.341	25.3		28	U	20 51.6	2.49
	29.0	290 48 43.1	1 31 42.6	16 19.1	59 47.35	+0.151	25.8		29	L	9 21.2	2.42
	29.5	298 1 9.6	0 53 19.0	16 19.2	59 47.95	−0.058	26.3		29	U	21 49.9	2.35
Mar.	1.0	305 13 40.2	−0 14 5.4	16 18.7	59 45.91	0.282	26.8	Mar.	1	L	10 17.6	2.27
	1.5	312 25 41.2	+0 25 17.2	16 17.4	59 41.13	0.516	27.3		1	U	22 44.3	2.19
	2.0	319 36 36.8	+1 4 7.5	16 15.3	59 33.54	−0.752	27.8		2	L	11 10.2	2.12
	2.5	326 45 49.3	1 41 45.5	16 12.5	59 23.12	0.984	28.3		2	U	23 35.2	2.06
	3.0	333 52 40.0	2 17 33.2	16 8.9	59 9.98	1.202	28.8		3	L	11 59.6	2.01
	3.5	340 56 31.1	2 50 56.2	16 4.6	58 54.35	1.400	29.3				. . . . .	. . .
	4.0	347 56 46.6	3 21 24.6	15 59.8	58 36.49	1.571	0.3		4	U	0 23.5	1.97
	4.5	354 52 54.7	+3 48 33.7	15 54.4	58 16.75	−1.711	0.8		4	L	12 47.0	1.95
	5.0	1 44 27.3	4 12 4.1	15 48.6	57 55.55	1.815	1.3		5	U	1 10.3	1.93
	5.5	8 31 2.2	4 31 42.1	15 42.6	57 33.34	1.881	1.8		5	L	13 33.4	1.93
	6.0	15 12 23.6	4 47 19.4	15 36.4	57 10.58	1.906	2.3		6	U	1 56.6	1.94
	6.5	21 48 22.3	4 58 52.4	15 30.1	56 47.76	1.892	2.8		6	L	14 19.9	1.95
	7.0	28 18 56.2	+5 6 21.8	15 24.0	56 25.29	−1.843	3.3		7	U	2 43.4	1.97
	7.5	34 44 9.7	5 9 52.2	15 18.1	56 3.65	1.761	3.8		7	L	15 7.1	1.99
	8.0	41 4 13.6	5 9 30.6	15 12.5	55 43.17	1.647	4.3		8	U	3 31.2	2.02
	8.5	47 19 25.3	5 5 26.4	15 7.4	55 24.23	1.506	4.8		8	L	15 55.6	2.05
	9.0	53 30 6.9	4 57 50.5	15 2.7	55 7.13	1.342	5.3		9	U	4 20.4	2.07
	9.5	59 36 45.1	+4 46 55.0	14 58.6	54 52.10	−1.159	5.8		9	L	16 45.4	2.09
	10.0	65 39 50.7	+4 32 52.5	14 55.2	54 39.36	−0.962	6.3		10	U	5 10.7	2.12

GREENWICH MEAN TIME.

G. M. T.		Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.				Var. per Hour.
		° ′ ″	° ′ ″	′ ″	′ ″	″	d				h m	m
ar.	10.0	65 39 50.7	+4 32 52.5	14 55.2	54 39.36	−0.962	6.3	Mar.	10	U	5 10.7	2.12
	10.5	71 39 57.2	4 15 56.0	14 52.3	54 29.05	0.754	6.8		10	L	17 36.2	2.12
	11.0	77 37 41.0	3 56 18.9	14 50.2	54 21.30	0.539	7.3		11	U	6 1.7	2.12
	11.5	83 33 39.8	3 34 14.4	14 48.8	54 16.17	0.319	7.8		11	L	18 27.1	2.11
	12.0	89 28 32.7	3 9 56.3	14 48.1	54 13.65	−0.099	8.3		12	U	6 52.4	2.09
	12.5	95 22 58.9	+2 43 38.3	14 48.2	54 13.77	+0.117	8.8		12	L	19 17.4	2.07
	13.0	101 17 37.9	2 15 34.6	14 48.9	54 16.43	0.327	9.3		13	U	7 42.1	2.04
	13.5	107 13 8.2	1 45 59.8	14 50.3	54 21.58	0.529	9.8		13	L	20 6.3	2.00
	14.0	113 10 7.4	1 15 9.7	14 52.3	54 29.08	0.720	10.3		14	U	8 30.1	1.97
	14.5	119 9 11.4	0 43 20.6	14 55.0	54 38.78	0.895	10.8		14	L	20 53.5	1.93
	15.0	125 10 53.4	+0 10 50.2	14 58.2	54 50.50	+1.053	11.3		15	U	9 16.5	1.89
	15.5	131 15 43.8	−0 22 2.5	15 1.8	55 3.97	1.191	11.8		15	L	21 39.0	1.87
	16.0	137 24 10.3	0 54 57.0	15 6.0	55 18.99	1.307	12.3		16	U	10 1.3	1.84
	16.5	143 36 35.7	1 27 31.2	15 10.4	55 35.25	1.400	12.8		16	L	22 23.3	1.83
	17.0	149 53 18.8	1 59 21.8	15 15.1	55 52.49	1.468	13.3		17	U	10 45.2	1.82
	17.5	156 14 33.4	−2 30 3.7	15 20.0	56 10.38	+1.510	13.8		17	L	23 7.1	1.82
	18.0	162 40 27.7	2 59 11.2	15 24.9	56 28.62	1.525	14.3		18	U	11 29.1	1.84
	18.5	169 11 4.4	3 26 18.0	15 29.9	56 46.88	1.514	14.8		18	L	23 51.3	1.87
	19.0	175 46 20.6	3 50 57.3	15 34.8	57 4.86	1.478	15.3		19	U	12 13.9	1.90
	19.5	182 26 7.6	4 12 43.4	15 39.5	57 22.28	1.420	15.8				. . . . .	. . .
	20.0	189 10 11.0	−4 31 11.7	15 44.1	57 38.87	+1.343	16.3		20	L	0 36.9	1.94
	20.5	195 58 12.3	4 46 0.0	15 48.3	57 54.44	1.248	16.8		20	U	13 0.6	2.01
	21.0	202 49 48.4	4 56 49.0	15 52.2	58 8.78	1.140	17.3		21	L	1 25.1	2.07
	21.5	209 44 33.8	5 3 22.9	15 55.8	58 21.77	1.024	17.8		21	U	13 50.4	2.15
	22.0	216 42 0.3	5 5 30.7	15 58.9	58 33.31	0.902	18.3		22	L	2 16.7	2.23
	22.5	223 41 39.9	−5 3 5.7	16 1.6	58 43.41	+0.778	18.8		22	U	14 44.0	2.31
	23.0	230 43 4.0	4 56 6.6	16 4.0	58 52.00	0.655	19.3		23	L	3 12.3	2.39
	23.5	237 45 46.4	4 44 37.1	16 5.9	58 59.15	0.535	19.8		23	U	15 41.5	2.47
	24.0	244 49 22.7	4 28 46.2	16 7.5	59 4.86	0.420	20.3		24	L	4 11.5	2.52
	24.5	251 53 31.1	4 8 47.6	16 8.7	59 9.24	0.310	20.8		24	U	16 42.1	2.57
	25.0	258 57 53.7	−3 44 59.4	16 9.5	59 12.33	+0.206	21.3		25	L	5 13.1	2.58
	25.5	266 2 15.3	3 17 44.1	16 10.0	59 14.20	0.106	21.8		25	U	17 44.0	2.57
	26.0	273 6 23.6	2 47 27.4	16 10.2	59 14.90	+0.009	22.3		26	L	6 14.7	2.53
	26.5	280 10 8.9	2 14 38.2	16 10.1	59 14.41	−0.087	22.8		26	U	18 44.8	2.47
	27.0	287 13 22.9	1 39 47.9	16 9.7	59 12.81	0.183	23.3		27	L	7 14.2	2.41
	27.5	294 15 58.9	−1 3 29.8	16 8.9	59 10.02	−0.282	23.8		27	U	19 42.7	2.33
	28.0	301 17 49.4	−0 26 18.5	16 7.8	59 6.02	0.385	24.3		28	L	8 10.2	2.25
	28.5	308 18 46.7	+0 11 10.8	16 6.4	59 0.79	0.492	24.8		28	U	20 36.8	2.18
	29.0	315 18 41.7	0 48 22.5	16 4.6	58 54.19	0.603	25.3		29	L	9 2.5	2.11
	29.5	322 17 23.0	1 24 41.8	16 2.4	58 46.27	0.719	25.8		29	U	21 27.5	2.05
	30.0	329 14 37.4	+1 59 35.2	15 59.9	58 36.94	−0.837	26.3		30	L	9 51.7	2.00
	30.5	336 10 8.8	2 32 31.0	15 57.0	58 26.20	0.954	26.8		30	U	22 15.5	1.96
	31.0	343 3 39.3	3 3 0.3	15 53.6	58 14.07	1.069	27.3		31	L	10 38.8	1.93
	31.5	349 54 49.3	3 30 37.5	15 50.0	58 0.57	1.178	27.8		31	U	23 1.9	1.92
pr.	1.0	356 43 17.9	3 55 0.6	15 46.0	57 45.84	1.276	28.3	Apr.	1	L	11 24.9	1.91
	1.5	3 28 44.3	+4 15 52.2	15 41.6	57 30.01	−1.359	28.8		1	U	23 47.8	1.92
	2.0	10 10 48.0	+4 32 58.9	15 37.1	57 13.27	−1.427	29.3		2	L	12 10.9	1.94

MOON, 1916.

GREENWICH MEAN TIME.

G. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.			Var. per Hour.
	° ′ ″	° ′ ″	′ ″	′ ″	″	d			h m	m
Apr. 1.0	356 43 17.9	+3 55 0.6	15 46.0	57 45.84	−1.276	28.3	Apr. 1	L	11 24.9	1.91
1.5	3 28 44.3	4 15 52.2	15 41.6	57 30.01	1.359	28.8	1	U	23 47.8	1.92
2.0	10 10 48.0	4 32 58.9	15 37.1	57 13.27	1.427	29.3	2	L	12 10.9	1.94
2.5	16 49 11.3	4 46 12.2	15 32.3	56 55.82	1.475	0.3			. . . . .	. . .
3.0	23 23 38.1	4 55 27.7	15 27.5	56 37.97	1.499	0.8	3	U	0 34.3	1.96
3.5	29 53 56.9	+5 0 45.1	15 22.6	56 19.95	−1.499	1.3	3	L	12 57.9	1.98
4.0	36 19 59.8	5 2 8.1	15 17.7	56 2.10	1.473	1.8	4	U	1 21.8	2.01
4.5	42 41 44.5	4 59 43.4	15 13.0	55 44.69	1.422	2.3	4	L	13 46.2	2.04
5.0	48 59 13.1	4 53 40.2	15 8.4	55 28.04	1.346	2.8	5	U	2 10.9	2.07
5.5	55 12 33.5	4 44 9.8	15 4.2	55 12.48	1.246	3.3	5	L	14 36.0	2.10
6.0	61 21 58.8	+4 31 25.2	15 0.3	54 58.24	−1.123	3.8	6	U	3 1.3	2.12
6.5	67 27 47.2	4 15 40.5	14 56.8	54 45.62	0.979	4.3	6	L	15 26.9	2.14
7.0	73 30 21.1	3 57 10.3	14 53.9	54 34.84	0.816	4.8	7	U	3 52.6	2.14
7.5	79 30 7.6	3 36 9.7	14 51.5	54 26.11	0.636	5.3	7	L	16 18.3	2.13
8.0	85 27 37.1	3 12 54.0	14 49.8	54 19.63	0.443	5.8	8	U	4 43.8	2.11
8.5	91 23 23.8	+2 47 38.4	14 48.6	54 15.52	−0.240	6.3	8	L	17 9.0	2.09
9.0	97 18 4.1	2 20 38.1	14 48.2	54 13.90	−0.029	6.8	9	U	5 33.9	2.06
9.5	103 12 16.6	1 52 8.7	14 48.5	54 14.84	+0.186	7.3	9	L	17 58.4	2.02
10.0	109 6 41.4	1 22 25.5	14 49.4	54 18.38	0.404	7.8	10	U	6 22.4	1.98
10.5	115 1 59.9	0 51 44.3	14 51.1	54 24.53	0.620	8.3	10	L	18 45.9	1.94
11.0	120 58 53.5	+0 20 21.2	14 53.5	54 33.25	+0.832	8.8	11	U	7 8.9	1.90
11.5	126 58 3.2	−0 11 26.5	14 56.5	54 44.47	1.036	9.3	11	L	19 31.5	1.87
12.0	133 0 9.3	0 43 21.1	15 0.2	54 58.07	1.227	9.8	12	U	7 53.8	1.84
12.5	139 5 50.1	1 15 3.5	15 4.5	55 13.84	1.402	10.3	12	L	20 15.8	1.82
13.0	145 15 41.6	1 46 13.2	15 9.4	55 31.62	1.557	10.8	13	U	8 37.6	1.81
13.5	151 30 16.0	−2 16 28.5	15 14.7	55 51.13	+1.689	11.3	13	L	20 59.3	1.81
14.0	157 50 1.0	2 45 26.2	15 20.4	56 12.04	1.793	11.8	14	U	9 21.1	1.82
14.5	164 15 19.0	3 12 41.7	15 26.4	56 34.05	1.866	12.3	14	L	21 43.1	1.84
15.0	170 46 26.4	3 37 49.3	15 32.6	56 56.71	1.905	12.8	15	U	10 5.4	1.87
15.5	177 23 31.2	4 0 22.9	15 38.8	57 19.62	1.907	13.3	15	L	22 28.1	1.92
16.0	184 6 34.1	−4 19 56.3	15 45.0	57 42.31	+1.870	13.8	16	U	10 51.5	1.98
16.5	190 55 26.7	4 36 4.1	15 51.0	58 4.33	1.793	14.3	16	L	23 15.7	2.05
17.0	197 49 51.8	4 48 23.0	15 56.7	58 25.21	1.679	14.8	17	U	11 40.8	2.13
17.5	204 49 23.9	4 56 32.2	16 2.0	58 44.52	1.531	15.3			. . . . .	. . .
18.0	211 53 29.4	5 0 15.0	16 6.7	59 1.85	1.352	15.8	18	L	0 6.8	2.22
18.5	219 1 27.4	−4 59 19.8	16 10.8	59 16.85	+1.148	16.3	18	U	12 34.0	2.31
19.0	226 12 32.5	4 53 40.8	16 14.2	59 29.32	0.925	16.8	19	L	1 2.3	2.40
19.5	233 25 55.7	4 43 18.4	16 16.8	59 39.01	0.690	17.3	19	U	13 31.7	2.49
20.0	240 40 47.2	4 28 20.0	16 18.7	59 45.85	0.452	17.8	20	L	2 2.1	2.56
20.5	247 56 17.7	4 8 59.3	16 19.8	59 49.87	+0.218	18.3	20	U	14 33.2	2.61
21.0	255 11 41.4	−3 45 36.2	16 20.1	59 51.14	−0.006	18.8	21	L	3 4.8	2.64
21.5	262 26 16.8	3 18 35.8	16 19.8	59 49.80	0.214	19.3	21	U	15 36.5	2.63
22.0	269 39 28.2	2 48 27.6	16 18.7	59 46.06	0.402	19.8	22	L	4 8.0	2.60
22.5	276 50 46.6	2 15 44.5	16 17.1	59 40.23	0.567	20.3	22	U	16 39.0	2.54
23.0	283 59 50.1	1 41 1.5	16 15.0	59 32.56	0.710	20.8	23	L	5 9.1	2.47
23.5	291 6 22.0	−1 4 54.8	16 12.5	59 23.29	−0.830	21.3	23	U	17 38.3	2.39
24.0	298 10 12.0	−0 28 0.6	16 9.6	59 12.74	−0.927	21.8	24	L	6 6.4	2.29

GREENWICH MEAN TIME.

G. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.			Var. per Hour.
	° ′ ″	° ′ ″	′ ″	′ ″	″	d			h m	m
pr. 24.0	298 10 12.0	−0 28 0.6	16 9.6	59 12.74	−0.927	21.8	Apr. 24	L	6 6.4	2.29
24.5	305 11 14.9	+0 9 5.3	16 6.5	59 1.15	1.004	22.3	24	U	18 33.4	2.21
25.0	312 9 28.6	0 45 47.8	16 3.1	58 48.71	1.065	22.8	25	L	6 59.4	2.13
25.5	319 4 54.1	1 21 34.4	15 59.5	58 35.64	1.112	23.3	25	U	19 24.5	2.06
26.0	325 57 33.3	1 55 54.1	15 55.8	58 22.09	1.147	23.8	26	L	7 48.8	1.99
26.5	332 47 29.2	+2 28 18.7	15 52.0	58 8.15	−1.174	24.3	26	U	20 12.4	1.94
27.0	339 34 44.1	2 58 22.4	15 48.2	57 53.94	1.195	24.8	27	L	8 35.5	1.91
27.5	346 19 19.5	3 25 42.5	15 44.2	57 39.49	1.212	25.3	27	U	20 58.3	1.89
28.0	353 1 15.1	3 49 59.4	15 40.2	57 24.88	1.224	25.8	28	L	9 20.8	1.88
28.5	359 40 29.3	4 10 56.6	15 36.2	57 10.12	1.233	26.3	28	U	21 43.4	1.88
29.0	6 16 59.0	+4 28 21.2	15 32.2	56 55.29	−1.239	26.8	29	L	10 5.9	1.89
29.5	12 50 39.4	4 42 3.6	15 28.1	56 40.40	1.242	27.3	29	U	22 28.7	1.91
30.0	19 21 24.7	4 51 57.8	15 24.1	56 25.50	1.239	27.8	30	L	10 51.8	1.94
30.5	25 49 9.1	4 58 1.2	15 20.0	56 10.70	1.229	28.3	30	U	23 15.2	1.97
ay 1.0	32 13 46.4	5 0 14.5	15 16.0	55 56.05	1.210	28.8	May 1	L	11 39.1	2.01
1.5	38 35 12.2	+4 58 41.6	15 12.1	55 41.68	−1.182	29.3			. . . . .	. . .
2.0	44 53 22.6	4 53 29.0	15 8.3	55 27.71	1.142	0.3	2	U	0 3.4	2.04
2.5	51 8 17.1	4 44 46.0	15 4.7	55 14.33	1.089	0.8	2	L	12 28.1	2.08
3.0	57 19 57.1	4 32 43.9	15 1.2	55 1.66	1.021	1.3	3	U	0 53.3	2.11
3.5	63 28 27.5	4 17 35.8	14 58.0	54 49.88	0.938	1.8	3	L	13 18.7	2.13
4.0	69 33 57.1	+3 59 36.3	14 55.1	54 39.18	−0.840	2.3	4	U	1 44.4	2.14
4.5	75 36 37.9	3 39 0.7	14 52.5	54 29.77	0.726	2.8	4	L	14 10.1	2.14
5.0	81 36 45.9	3 16 5.1	14 50.4	54 21.84	0.596	3.3	5	U	2 35.8	2.13
5.5	87 34 41.3	2 51 6.4	14 48.7	54 15.55	0.450	3.8	5	L	15 1.3	2.11
6.0	93 30 47.4	2 24 21.0	14 47.4	54 11.07	0.290	4.3	6	U	3 26.5	2.08
6.5	99 25 31.5	+1 56 5.9	14 46.8	54 8.63	−0.118	4.8	6	L	15 51.3	2.04
7.0	105 19 23.8	1 26 37.9	14 46.7	54 8.31	+0.066	5.3	7	U	4 15.5	2.00
7.5	111 12 57.7	0 56 13.7	14 47.2	54 10.26	0.261	5.8	7	L	16 39.3	1.96
8.0	117 6 49.0	+0 25 10.2	14 48.4	54 14.60	0.464	6.3	8	U	5 2.5	1.91
8.5	123 1 35.9	−0 6 15.9	14 50.2	54 21.40	0.671	6.8	8	L	17 25.2	1.87
9.0	128 57 57.6	−0 37 47.2	14 52.8	54 30.71	+0.881	7.3	9	U	5 47.4	1.83
9.5	134 56 35.2	1 9 6.2	14 56.0	54 42.54	1.091	7.8	9	L	18 9.2	1.81
10.0	140 58 9.5	1 39 54.5	14 59.9	54 56.86	1.295	8.3	10	U	6 30.8	1.79
10.5	147 3 21.7	2 9 53.1	15 4.5	55 13.60	1.491	8.8	10	L	18 52.2	1.78
11.0	153 12 51.8	2 38 41.9	15 9.7	55 32.60	1.675	9.3	11	U	7 13.5	1.77
11.5	159 27 17.1	−3 5 59.5	15 15.4	55 53.75	+1.842	9.8	11	L	19 34.8	1.79
12.0	165 47 12.6	3 31 23.7	15 21.7	56 16.74	1.986	10.3	12	U	7 56.4	1.82
12.5	172 13 8.8	3 54 31.1	15 28.4	56 41.30	2.102	10.8	12	L	20 18.4	1.85
13.0	178 45 30.2	4 14 57.4	15 35.4	57 7.07	2.185	11.3	13	U	8 40.9	1.90
13.5	185 24 35.0	4 32 18.1	15 42.6	57 33.58	2.228	11.8	13	L	21 4.1	1.97
14.0	192 10 32.1	−4 46 8.8	15 49.9	58 0.36	+2.227	12.3	14	U	9 28.1	2.04
14.5	199 3 21.9	4 56 6.3	15 57.1	58 26.83	2.178	12.8	14	L	21 53.2	2.14
15.0	206 2 53.4	5 1 49.5	16 4.1	58 52.44	2.080	13.3	15	U	10 19.4	2.23
15.5	213 8 45.6	5 3 0.5	16 10.7	59 16.55	1.931	13.8	15	L	22 46.8	2.34
16.0	220 20 25.4	4 59 26.3	16 16.7	59 38.58	1.731	14.3	16	U	11 15.6	2.45
16.5	227 37 10.2	−4 50 59.6	16 22.0	59 57.94	+1.487	14.8	16	L	23 45.6	2.54
17.0	234 58 7.5	−4 37 40.2	16 26.4	60 14.12	+1.205	15.3	17	U	12 16.7	2.63

MOON, 1916.

GREENWICH MEAN TIME.

G. M. T.		Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.				Var. per Hour.
		° ′ ″	° ′ ″	′ ″	′ ″	″	d				h m	m
May	17.0	234 58 7.5	−4 37 40.2	16 26.4	60 14.12	+1.205	15.3	May	17	U	12 16.7	2.63
	17.5	242 22 18.4	4 19 35.2	16 29.8	60 26.72	0.893	15.8				. . . . .	. . .
	18.0	249 48 38.4	3 56 59.9	16 32.2	60 35.46	0.562	16.3		18	L	0 48.8	2.69
	18.5	257 16 1.9	3 30 17.1	16 33.5	60 40.15	+0.222	16.8		18	U	13 21.4	2.72
	19.0	264 43 23.9	2 59 56.6	16 33.6	60 40.81	−0.113	17.3		19	L	1 54.2	2.72
	19.5	272 9 42.7	−2 26 33.8	16 32.7	60 37.52	−0.431	17.8		19	U	14 26.6	2.68
	20.0	279 34 2.7	1 50 48.4	16 30.8	60 30.56	0.723	18.3		20	L	2 58.5	2.62
	20.5	286 55 36.0	1 13 22.4	16 28.0	60 20.27	0.984	18.8		20	U	15 29.4	2.53
	21.0	294 13 43.4	−0 34 58.9	16 24.5	60 7.08	1.208	19.3		21	L	3 59.2	2.43
	21.5	301 27 53.9	+0 3 40.2	16 20.2	59 51.45	1.390	19.8		21	U	16 27.7	2.32
	22.0	308 37 46.4	+0 41 54.5	16 15.4	59 33.90	−1.530	20.3		22	L	4 55.0	2.22
	22.5	315 43 7.3	1 19 6.8	16 10.2	59 14.92	1.630	20.8		22	U	17 21.1	2.14
	23.0	322 43 50.4	1 54 43.4	16 4.8	58 54.94	1.692	21.3		23	L	5 46.3	2.06
	23.5	329 39 55.5	2 28 14.5	15 59.2	58 34.43	1.722	21.8		23	U	18 10.5	1.99
	24.0	336 31 26.8	2 59 14.5	15 53.6	58 13.74	1.724	22.3		24	L	6 34.1	1.94
	24.5	343 18 32.5	+3 27 21.6	15 48.0	57 53.17	−1.703	22.8		24	U	18 57.1	1.90
	25.0	350 1 22.6	3 52 17.9	15 42.4	57 32.94	1.663	23.3		25	L	7 19.7	1.87
	25.5	356 40 8.4	4 13 49.4	15 37.1	57 13.31	1.609	23.8		25	U	19 42.1	1.86
	26.0	3 15 2.4	4 31 45.1	15 31.9	56 54.38	1.545	24.3		26	L	8 4.4	1.86
	26.5	9 46 16.1	4 45 57.7	15 27.0	56 36.26	1.474	24.8		26	U	20 26.8	1.87
	27.0	16 14 0.8	+4 56 22.4	15 22.3	56 19.02	−1.398	25.3		27	L	8 49.4	1.89
	27.5	22 38 26.8	5 2 57.5	15 17.9	56 2.69	1.322	25.8		27	U	21 12.3	1.92
	28.0	28 59 43.4	5 5 43.8	15 13.7	55 47.26	1.246	26.3		28	L	9 35.6	1.96
	28.5	35 17 58.9	5 4 44.8	15 9.7	55 32.80	1.168	26.8		28	U	21 59.3	1.99
	29.0	41 33 21.0	5 0 6.1	15 6.0	55 19.25	1.090	27.3		29	L	10 23.5	2.03
	29.5	47 45 56.3	+4 51 55.5	15 2.6	55 6.63	−1.012	27.8		29	U	22 48.1	2.07
	30.0	53 55 51.7	4 40 22.8	14 59.4	54 54.97	0.933	28.3		30	L	11 13.1	2.10
	30.5	60 3 13.7	4 25 39.6	14 56.5	54 44.26	0.851	28.8		30	U	23 38.5	2.12
	31.0	66 8 10.2	4 7 59.1	14 53.8	54 34.55	0.766	29.3		31	L	12 4.1	2.14
	31.5	72 10 49.5	3 47 36.1	14 51.5	54 25.91	0.676	0.2				. . . . .	. . .
June	1.0	78 11 21.9	+3 24 45.9	14 49.4	54 18.35	−0.579	0.7	June	1	U	0 29.8	2.14
	1.5	84 9 58.4	2 59 45.3	14 47.7	54 12.02	0.475	1.2		1	L	12 55.4	2.12
	2.0	90 6 53.1	2 32 51.4	14 46.3	54 6.98	0.364	1.7		2	U	1 20.8	2.10
	2.5	96 2 22.0	2 4 22.0	14 45.3	54 3.32	0.243	2.2		2	L	13 45.8	2.07
	3.0	101 56 43.2	1 34 35.0	14 44.7	54 1.18	−0.112	2.7		3	U	2 10.4	2.03
	3.5	107 50 18.0	+1 3 48.4	14 44.6	54 0.68	+0.030	3.2		3	L	14 34.5	1.98
	4.0	113 43 29.9	0 32 20.4	14 45.0	54 1.94	0.182	3.7		4	U	2 58.0	1.93
	4.5	119 36 45.5	+0 0 29.1	14 45.8	54 5.08	0.344	4.2		4	L	15 20.9	1.89
	5.0	125 30 33.2	−0 31 27.4	14 47.2	54 10.23	0.515	4.7		5	U	3 43.3	1.84
	5.5	131 25 23.5	1 3 10.9	14 49.2	54 17.49	0.695	5.2		5	L	16 5.2	1.81
	6.0	137 21 50.8	−1 34 23.4	14 51.8	54 26.95	+0.883	5.7		6	U	4 26.7	1.78
	6.5	143 20 29.3	2 4 46.5	14 55.0	54 38.69	1.074	6.2		6	L	16 47.9	1.75
	7.0	149 21 56.0	2 34 1.1	14 58.8	54 52.74	1.267	6.7		7	U	5 8.8	1.74
	7.5	155 26 47.8	3 1 48.7	15 3.2	55 9.10	1.460	7.2		7	L	17 29.7	1.74
	8.0	161 35 42.2	3 27 49.2	15 8.3	55 27.74	1.647	7.7		8	U	5 50.6	1.75
	8.5	167 49 16.5	−3 51 42.4	15 14.0	55 48.58	+1.825	8.2		8	L	18 11.7	1.77
	9.0	174 8 6.0	−4 13 7.7	15 20.3	56 11.49	+1.990	8.7		9	U	6 33.1	1.81

GREENWICH MEAN TIME.

G. M. T.		Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.				Var. per Hour.
		° ′ ″	° ′ ″	′ ″	′ ″	″	d				h m	m
ne	9.0	174 8 6.0	−4 13 7.7	15 20.3	56 11.49	+1.990	8.7	June	9	U	6 33.1	1.81
	9.5	180 32 43.7	4 31 43.4	15 27.0	56 36.26	2.135	9.2		9	L	18 55.1	1.86
	10.0	187 3 39.0	4 47 7.9	15 34.2	57 2.64	2.254	9.7		10	U	7 17.7	1.92
	10.5	193 41 16.0	4 58 59.6	15 41.7	57 30.23	2.341	10.2		10	L	19 41.2	2.00
	11.0	200 25 52.9	5 6 57.6	15 49.5	57 58.66	2.389	10.7		11	U	8 5.7	2.09
	11.5	207 17 38.8	−5 10 42.4	15 57.3	58 27.37	+2.391	11.2		11	L	20 31.4	2.19
	12.0	214 16 34.3	5 9 57.0	16 5.0	58 55.82	2.341	11.7		12	U	8 58.4	2.31
	12.5	221 22 29.6	5 4 28.0	16 12.5	59 23.34	2.236	12.2		12	L	21 26.8	2.42
	13.0	228 35 2.7	4 54 6.6	16 19.6	59 49.27	2.074	12.7		13	U	9 56.6	2.54
	13.5	235 53 40.7	4 38 50.6	16 26.0	60 12.88	1.852	13.2		13	L	22 27.7	2.64
	14.0	243 17 38.6	−4 18 44.7	16 31.6	60 33.48	+1.574	13.7		14	U	10 59.9	2.71
	14.5	250 46 2.0	3 54 2.1	16 36.3	60 50.47	1.249	14.2		14	L	23 32.8	2.76
	15.0	258 17 47.3	3 25 3.9	16 39.8	61 3.31	0.885	14.7		15	U	12 6.1	2.77
	15.5	265 51 44.9	2 52 19.9	16 42.0	61 11.60	0.493	15.2				. . . . .	. . .
	16.0	273 26 41.8	2 16 27.0	16 43.0	61 15.10	+0.087	15.7		16	L	0 39.3	2.74
	16.5	281 1 25.0	−1 38 8.3	16 42.6	61 13.72	−0.315	16.2		16	U	13 12.0	2.69
	17.0	288 34 43.4	0 58 10.7	16 41.0	61 7.61	0.700	16.7		17	L	1 43.8	2.60
	17.5	296 5 32.1	−0 17 23.2	16 38.1	60 57.06	1.055	17.2		17	U	14 14.4	2.50
	18.0	303 32 52.6	+0 23 25.5	16 34.1	60 42.45	1.370	17.7		18	L	2 43.8	2.39
	18.5	310 55 56.4	1 3 28.8	16 29.2	60 24.38	1.636	18.2		18	U	15 11.9	2.29
	19.0	318 14 4.0	+1 42 3.8	16 23.4	60 3.42	−1.848	18.7		19	L	3 38.8	2.19
	19.5	325 26 46.4	2 18 32.8	16 17.1	59 40.25	2.006	19.2		19	U	16 4.6	2.11
	20.0	332 33 44.1	2 52 23.4	16 10.4	59 15.50	2.111	19.7		20	L	4 29.4	2.03
	20.5	339 34 46.8	3 23 9.2	16 3.4	58 49.80	2.165	20.2		20	U	16 53.4	1.98
	21.0	346 29 52.0	3 50 29.8	15 56.3	58 23.71	2.175	20.7		21	L	5 16.9	1.94
	21.5	353 19 4.1	+4 14 9.6	15 49.2	57 57.73	−2.148	21.2		21	U	17 39.9	1.90
	22.0	0 2 33.3	4 33 58.1	15 42.3	57 32.30	2.088	21.7		22	L	6 2.6	1.89
	22.5	6 40 33.3	4 49 48.9	15 35.6	57 7.74	2.000	22.2		22	U	18 25.2	1.89
	23.0	13 13 21.6	5 1 39.5	15 29.2	56 44.36	1.893	22.7		23	L	6 47.9	1.89
	23.5	19 41 17.7	5 9 30.0	15 23.2	56 22.35	1.773	23.2		23	U	19 10.7	1.91
	24.0	26 4 42.4	+5 13 23.7	15 17.6	56 1.84	−1.645	23.7		24	L	7 33.8	1.94
	24.5	32 23 56.9	5 13 25.6	15 12.5	55 42.92	1.509	24.2		24	U	19 57.2	1.97
	25.0	38 39 22.6	5 9 42.4	15 7.8	55 25.64	1.370	24.7		25	L	8 21.0	2.00
	25.5	44 51 20.5	5 2 23.1	15 3.5	55 10.03	1.233	25.2		25	U	20 45.2	2.03
	26.0	51 0 11.1	4 51 37.6	14 59.7	54 56.04	1.098	25.7		26	L	9 9.8	2.07
	26.5	57 6 13.5	+4 37 37.4	14 56.3	54 43.66	−0.967	26.2		26	U	21 34.9	2.10
	27.0	63 9 46.4	4 20 34.9	14 53.4	54 32.82	0.841	26.7		27	L	10 0.2	2.11
	27.5	69 11 7.3	4 0 43.8	14 50.8	54 23.47	0.718	27.2		27	U	22 25.6	2.12
	28.0	75 10 33.1	3 38 18.9	14 48.7	54 15.58	0.599	27.7		28	L	10 51.1	2.12
	28.5	81 8 19.7	3 13 35.9	14 46.9	54 9.07	0.485	28.2		28	U	23 16.6	2.11
	29.0	87 4 43.0	+2 46 51.1	14 45.5	54 3.94	−0.373	28.7		29	L	11 41.8	2.08
	29.5	92 59 58.4	2 18 21.7	14 44.5	54 0.12	0.262	29.2				. . . . .	. . .
	30.0	98 54 21.8	1 48 25.7	14 43.8	53 57.65	0.150	0.0		30	U	0 6.6	2.05
	30.5	104 48 9.0	1 17 21.5	14 43.5	53 56.54	−0.038	0.5		30	L	12 31.0	2.01
ly	1.0	110 41 37.0	0 45 27.8	14 43.5	53 56.73	+0.076	1.0	July	1	U	0 54.9	1.97
	1.5	116 35 3.1	+0 13 3.7	14 44.0	53 58.34	+0.193	1.5		1	L	13 18.3	1.92
	2.0	122 28 46.0	−0 19 31.9	14 44.8	54 1.41	+0.316	2.0		2	U	1 41.0	1.87

MOON, 1916.

GREENWICH MEAN TIME.

G. M. T.		Longitude.	Latitude.	Semidiameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.				Var. per Hour.
		° ′ ″	° ′ ″	′ ″	′ ″	″	d				h m	m
July	1.0	110 41 37.0	+0 45 27.8	14 43.5	53 56.73	+0.076	1.0	July	1	U	0 54.9	1.97
	1.5	116 35 3.1	+0 13 3.7	14 44.0	53 58.34	0.193	1.5		1	L	13 18.3	1.92
	2.0	122 28 46.0	−0 19 31.9	14 44.8	54 1.41	0.316	2.0		2	U	1 41.0	1.87
	2.5	128 23 5.8	0 51 59.2	14 46.0	54 5.95	0.446	2.5		2	L	14 3.2	1.83
	3.0	134 18 24.0	1 23 59.3	14 47.7	54 12.10	0.582	3.0		3	U	2 24.9	1.79
	3.5	140 15 3.4	−1 55 12.8	14 49.8	54 19.91	+0.723	3.5		3	L	14 46.2	1.76
	4.0	146 13 28.6	2 25 20.5	14 52.4	54 29.47	0.871	4.0		4	U	3 7.1	1.74
	4.5	152 14 5.5	2 54 3.4	14 55.6	54 40.86	1.026	4.5		4	L	15 27.9	1.72
	5.0	158 17 21.9	3 21 2.4	14 59.2	54 54.11	1.185	5.0		5	U	3 48.5	1.72
	5.5	164 23 46.3	3 45 58.5	15 3.3	55 9.30	1.348	5.5		5	L	16 9.1	1.72
	6.0	170 33 47.8	−4 8 33.0	15 8.0	55 26.45	+1.511	6.0		6	U	4 29.9	1.74
	6.5	176 47 56.9	4 28 26.8	15 13.2	55 45.54	1.671	6.5		6	L	16 51.0	1.77
	7.0	183 6 42.9	4 45 21.4	15 18.9	56 6.52	1.825	7.0		7	U	5 12.5	1.82
	7.5	189 30 34.5	4 58 58.2	15 25.1	56 29.30	1.969	7.5		7	L	17 34.7	1.88
	8.0	195 59 58.7	5 8 59.2	15 31.8	56 53.71	2.097	8.0		8	U	5 57.6	1.95
	8.5	202 35 19.5	−5 15 7.5	15 38.8	57 19.54	+2.203	8.5		8	L	18 21.5	2.04
	9.0	209 16 57.1	5 17 7.1	15 46.1	57 46.47	2.280	9.0		9	U	6 46.5	2.14
	9.5	216 5 6.7	5 14 44.1	15 53.7	58 14.12	2.322	9.5		9	L	19 12.8	2.24
	10.0	222 59 56.4	5 7 47.7	16 1.3	58 42.05	2.323	10.0		10	U	7 40.4	2.36
	10.5	230 1 27.2	4 56 10.3	16 8.8	59 9.68	2.276	10.5		10	L	20 9.4	2.47
	11.0	237 9 30.9	−4 39 49.4	16 16.1	59 36.44	+2.174	11.0		11	U	8 39.7	2.57
	11.5	244 23 49.5	4 18 48.5	16 23.0	60 1.65	2.015	11.5		11	L	21 11.1	2.66
	12.0	251 43 54.4	3 53 17.4	16 29.2	60 24.58	1.797	12.0		12	U	9 43.5	2.72
	12.5	259 9 7.1	3 23 34.0	16 34.7	60 44.58	1.523	12.5		12	L	22 16.4	2.74
	13.0	266 38 38.0	2 50 3.9	16 39.1	61 0.94	1.198	13.0		13	U	10 49.4	2.74
	13.5	274 11 29.9	−2 13 20.2	16 42.5	61 13.14	+0.828	13.5		13	L	23 22.1	2.70
	14.0	281 46 37.5	1 34 3.8	16 44.5	61 20.69	0.427	14.0		14	U	11 54.2	2.63
	14.5	289 22 50.8	0 53 0.6	16 45.2	61 23.32	+0.008	14.5				. . . . .	. . .
	15.0	296 58 57.5	−0 11 0.8	16 44.6	61 20.89	−0.412	15.0		15	L	0 25.3	2.54
	15.5	304 33 45.5	+0 31 4.1	16 42.6	61 13.49	0.818	15.5		15	U	12 55.3	2.45
	16.0	312 6 5.8	+1 12 22.9	16 39.2	61 1.35	−1.196	16.0		16	L	1 24.1	2.35
	16.5	319 34 55.1	1 52 7.6	16 34.8	60 44.94	1.534	16.5		16	U	13 51.7	2.26
	17.0	326 59 17.4	2 29 34.6	16 29.3	60 24.76	1.820	17.0		17	L	2 18.3	2.17
	17.5	334 18 25.7	3 4 6.8	16 22.9	60 1.50	2.048	17.5		17	U	14 43.9	2.10
	18.0	341 31 43.0	3 35 13.5	16 15.9	59 35.85	2.217	18.0		18	L	3 8.8	2.04
	18.5	348 38 42.8	+4 2 31.6	16 8.5	59 8.52	−2.328	18.5		18	U	15 33.0	2.00
	19.0	355 39 8.8	4 25 45.0	16 0.8	58 40.20	2.382	19.0		19	L	3 56.8	1.97
	19.5	2 32 53.6	4 44 43.6	15 53.0	58 11.56	2.385	19.5		19	U	16 20.2	1.94
	20.0	9 19 58.8	4 59 23.0	15 45.2	57 43.14	2.343	20.0		20	L	4 43.5	1.94
	20.5	16 0 33.8	5 9 43.6	15 37.7	57 15.46	2.263	20.5		20	U	17 6.8	1.94
	21.0	22 34 53.8	+5 15 49.5	15 30.5	56 48.95	−2.153	21.0		21	L	5 30.2	1.96
	21.5	29 3 19.1	5 17 47.7	15 23.6	56 23.91	2.018	21.5		21	U	17 53.8	1.98
	22.0	35 26 13.7	5 15 47.5	15 17.3	56 0.62	1.863	22.0		22	L	6 17.7	2.00
	22.5	41 44 4.8	5 10 0.0	15 11.5	55 39.25	1.696	22.5		22	U	18 41.9	2.03
	23.0	47 57 21.0	5 0 37.2	15 6.2	55 19.92	1.522	23.0		23	L	7 6.5	2.06
	23.5	54 6 32.4	+4 47 52.3	15 1.5	55 2.73	−1.344	23.5		23	U	19 31.4	2.08
	24.0	60 12 8.6	+4 31 59.0	14 57.4	54 47.66	−1.165	24.0		24	L	7 56.5	2.10

GREENWICH MEAN TIME.

. M. T.		Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.				Var. per Hour.
		° ′ ″	° ′ ″	′ ″	′ ″	″	d				h m	m
ly	24.0	60 12 8.6	+4 31 59.0	14 57.4	54 47.66	−1.165	24.0	July	24	L	7 56.5	2.10
	24.5	66 14 40.1	4 13 11.6	14 53.9	54 34.74	0.990	24.5		24	U	20 21.9	2.12
	25.0	72 14 35.7	3 51 44.9	14 50.9	54 23.88	0.820	25.0		25	L	8 47.4	2.12
	25.5	78 12 24.0	3 27 54.2	14 48.5	54 15.04	0.656	25.5		25	U	21 12.8	2.11
	26.0	84 8 31.9	3 1 55.3	14 46.6	54 8.11	0.499	26.0		26	L	9 38.1	2.09
	26.5	90 3 24.6	+2 34 4.5	14 45.2	54 3.04	−0.351	26.5		26	U	22 3.1	2.07
	27.0	95 57 26.4	2 4 38.8	14 44.3	53 59.67	0.210	27.0		27	L	10 27.8	2.04
	27.5	101 50 59.8	1 33 55.6	14 43.9	53 57.95	−0.078	27.5		27	U	22 52.0	1.99
	28.0	107 44 26.0	1 2 12.9	14 43.8	53 57.77	+0.046	28.0		28	L	11 15.7	1.95
	28.5	113 38 4.5	+0 29 49.4	14 44.2	53 59.03	0.163	28.5		28	U	23 38.9	1.91
	29.0	119 32 14.1	−0 2 55.7	14 44.9	54 1.67	+0.276	29.0		29	L	12 1.5	1.86
	29.5	125 27 12.3	0 35 42.9	14 46.0	54 5.64	0.384	29.5				. . . . .	. . .
	30.0	131 23 16.0	1 8 12.4	14 47.4	54 10.86	0.487	0.4		30	U	0 23.6	1.82
	30.5	137 20 41.3	1 40 3.9	14 49.1	54 17.32	0.589	0.9		30	L	12 45.3	1.79
	31.0	143 19 44.0	2 10 57.3	14 51.2	54 25.02	0.693	1.4		31	U	1 6.5	1.76
	31.5	149 20 39.7	−2 40 32.3	14 53.7	54 33.94	+0.796	1.9		31	L	13 27.5	1.74
ug.	1.0	155 23 44.3	3 8 29.0	14 56.4	54 44.12	0.899	2.4	Aug.	1	U	1 48.2	1.72
	1.5	161 29 13.7	3 34 27.6	14 59.6	54 55.52	1.005	2.9		1	L	14 8.8	1.72
	2.0	167 37 24.3	3 58 9.3	15 3.0	55 8.24	1.114	3.4		2	U	2 29.5	1.73
	2.5	173 48 33.2	4 19 15.3	15 6.8	55 22.30	1.226	3.9		2	L	14 50.3	1.74
	3.0	180 2 57.6	−4 37 28.1	15 11.0	55 37.69	+1.340	4.4		3	U	3 11.4	1.77
	3.5	186 20 55.4	4 52 30.6	15 15.6	55 54.45	1.454	4.9		3	L	15 32.9	1.82
	4.0	192 42 44.7	5 4 7.1	15 20.5	56 12.58	1.567	5.4		4	U	3 55.0	1.87
	4.5	199 8 43.9	5 12 3.1	15 25.8	56 32.04	1.675	5.9		4	L	16 17.8	1.93
	5.0	205 39 10.6	5 16 5.5	15 31.5	56 52.74	1.776	6.4		5	U	4 41.4	2.01
	5.5	212 14 21.5	−5 16 3.1	15 37.4	57 14.59	+1.864	6.9		5	L	17 6.1	2.10
	6.0	218 54 32.3	5 11 46.9	15 43.7	57 37.41	1.936	7.4		6	U	5 31.9	2.20
	6.5	225 39 55.2	5 3 10.4	15 50.1	58 0.96	1.986	7.9		6	L	17 58.9	2.30
	7.0	232 30 40.6	4 50 10.4	15 56.6	58 24.95	2.008	8.4		7	U	6 27.1	2.40
	7.5	239 26 54.0	4 32 47.6	16 3.2	58 49.04	1.995	8.9		7	L	18 56.5	2.49
	8.0	246 28 35.6	−4 11 6.9	16 9.6	59 12.69	+1.943	9.4		8	U	7 26.9	2.57
	8.5	253 35 40.0	3 45 18.9	16 15.8	59 35.48	1.847	9.9		8	L	19 58.2	2.63
	9.0	260 47 54.1	3 15 39.5	16 21.7	59 56.84	1.704	10.4		9	U	8 30.0	2.66
	9.5	268 4 57.5	2 42 31.0	16 26.9	60 16.17	1.510	10.9		9	L	21 2.0	2.66
	10.0	275 26 20.9	2 6 22.3	16 31.5	60 32.88	1.266	11.4		10	U	9 33.9	2.64
	10.5	282 51 26.8	−1 27 48.5	16 35.2	60 46.39	+0.977	11.9		10	L	22 5.3	2.58
	11.0	290 19 29.7	0 47 30.1	16 37.8	60 56.20	0.650	12.4		11	U	10 35.9	2.52
	11.5	297 49 36.3	−0 6 12.3	16 39.4	61 1.85	+0.291	12.9		11	L	23 5.7	2.44
	12.0	305 20 47.7	+0 35 16.5	16 39.7	61 3.10	−0.087	13.4		12	U	11 34.5	2.36
	12.5	312 52 0.5	1 16 7.1	16 38.8	60 59.77	0.470	13.9				. . . . .	. . .
	13.0	320 22 9.4	+1 55 31.0	16 36.7	60 51.87	−0.844	14.4		13	L	0 2.3	2.27
	13.5	327 50 9.3	2 32 42.8	16 33.3	60 39.60	1.196	14.9		13	U	12 29.2	2.21
	14.0	335 14 58.0	3 7 1.8	16 28.9	60 23.30	1.513	15.4		14	L	0 55.3	2.14
	14.5	342 35 38.4	3 37 53.7	16 23.5	60 3.45	1.786	15.9		14	U	13 20.7	2.09
	15.0	349 51 20.0	4 4 51.1	16 17.2	59 40.63	2.009	16.4		15	L	1 45.6	2.05
	15.5	357 1 21.6	+4 27 34.3	16 10.4	59 15.45	−2.177	16.9		15	U	14 10.0	2.02
	16.0	4 5 11.0	+4 45 51.0	16 3.1	58 48.62	−2.287	17.4		16	L	2 34.2	2.01

GREENWICH MEAN TIME.

G. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.			Var. per Hour.
	° ′ ″	° ′ ″	′ ″	′ ″	″	d			h m	m
Aug. 16.0	4 5 11.0	+4 45 51.0	16 3.1	58 48.62	−2.287	17.4	Aug. 16	L	2 34.2	2.01
16.5	11 2 26.6	4 59 35.7	15 55.5	58 20.77	2.343	17.9	16	U	14 58.3	2.01
17.0	17 52 56.6	5 8 48.6	15 47.8	57 52.57	2.349	18.4	17	L	3 22.4	2.01
17.5	24 36 38.8	5 13 35.4	15 40.2	57 24.60	2.308	18.9	17	U	15 46.5	2.02
18.0	31 13 39.6	5 14 5.0	15 32.8	56 57.37	2.225	19.4	18	L	4 10.9	2.04
18.5	37 44 13.6	+5 10 29.8	15 25.7	56 31.33	−2.109	19.9	18	U	16 35.5	2.06
19.0	44 8 41.1	5 3 3.9	15 19.0	56 6.86	1.965	20.4	19	L	5 0.4	2.08
19.5	50 27 28.3	4 52 2.8	15 12.8	55 44.25	1.799	20.9	19	U	17 25.5	2.10
20.0	56 41 5.3	4 37 42.8	15 7.2	55 23.73	1.618	21.4	20	L	5 50.8	2.12
20.5	62 50 5.1	4 20 20.5	15 2.3	55 5.47	1.426	21.9	20	U	18 16.4	2.13
21.0	68 55 3.2	+4 0 12.6	14 57.9	54 49.56	−1.226	22.4	21	L	6 42.0	2.13
21.5	74 56 35.5	3 37 35.8	14 54.2	54 36.06	1.022	22.9	21	U	19 7.6	2.13
22.0	80 55 18.9	3 12 46.6	14 51.2	54 24.99	0.820	23.4	22	L	7 33.1	2.12
22.5	86 51 50.1	2 46 1.5	14 48.9	54 16.34	0.623	23.9	22	U	19 58.4	2.09
23.0	92 46 44.4	2 17 37.1	14 47.1	54 10.01	0.432	24.4	23	L	8 23.4	2.06
23.5	98 40 36.6	+1 47 50.2	14 46.0	54 5.93	−0.248	24.9	23	U	20 47.9	2.02
24.0	104 33 59.6	1 16 57.8	14 45.5	54 4.01	−0.074	25.4	24	L	9 11.9	1.98
24.5	110 27 24.2	0 45 17.2	14 45.5	54 4.10	+0.088	25.9	24	U	21 35.5	1.94
25.0	116 21 19.1	+0 13 6.4	14 46.1	54 6.07	0.238	26.4	25	L	9 58.5	1.89
25.5	122 16 10.8	−0 19 16.3	14 47.1	54 9.75	0.376	26.9	25	U	22 21.0	1.86
26.0	128 12 23.1	−0 51 31.9	14 48.5	54 15.04	+0.502	27.4	26	L	10 43.1	1.82
26.5	134 10 17.4	1 23 20.6	14 50.4	54 21.75	0.615	27.9	26	U	23 4.7	1.79
27.0	140 10 12.3	1 54 22.5	14 52.5	54 29.75	0.716	28.4	27	L	11 26.0	1.77
27.5	146 12 23.9	2 24 16.9	14 55.0	54 38.88	0.806	28.9	27	U	23 47.1	1.75
28.0	152 17 6.0	2 52 43.3	14 57.8	54 49.06	0.886	29.4	28	L	12 8.0	1.74
28.5	158 24 29.5	−3 19 20.8	15 0.8	55 0.12	+0.958	0.3			. . . . .	. . .
29.0	164 34 44.0	3 43 49.3	15 4.0	55 12.04	1.022	0.8	29	U	0 28.8	1.74
29.5	170 47 56.5	4 5 48.7	15 7.5	55 24.67	1.079	1.3	29	L	12 49.7	1.75
30.0	177 4 12.8	4 25 0.3	15 11.1	55 37.94	1.133	1.8	30	U	1 10.9	1.77
30.5	183 23 36.9	4 41 6.3	15 14.9	55 51.85	1.184	2.3	30	L	13 32.3	1.80
31.0	189 46 12.8	−4 53 50.6	15 18.8	56 6.33	+1.231	2.8	31	U	1 54.2	1.85
31.5	196 12 3.1	5 2 59.0	15 22.9	56 21.36	1.276	3.3	31	L	14 16.7	1.90
Sept. 1.0	202 41 11.0	5 8 19.4	15 27.2	56 36.95	1.320	3.8	Sept. 1	U	2 39.9	1.97
1.5	209 13 39.2	5 9 42.1	15 31.6	56 53.03	1.361	4.3	1	L	15 3.9	2.04
2.0	215 49 30.9	5 7 0.0	15 36.1	57 9.59	1.399	4.8	2	U	3 28.8	2.12
2.5	222 28 49.4	−5 0 9.3	15 40.7	57 26.58	+1.432	5.3	2	L	15 54.7	2.20
3.0	229 11 38.8	4 49 8.7	15 45.4	57 43.94	1.457	5.8	3	U	4 21.7	2.29
3.5	235 58 2.6	4 34 0.9	15 50.2	58 1.55	1.474	6.3	3	L	16 49.7	2.37
4.0	242 48 4.5	4 14 51.8	15 55.1	58 19.27	1.477	6.8	4	U	5 18.7	2.45
4.5	249 41 47.2	3 51 51.5	15 59.9	58 36.92	1.461	7.3	4	L	17 48.5	2.51
5.0	256 39 12.1	−3 25 14.1	16 4.6	58 54.26	+1.423	7.8	5	U	6 18.9	2.54
5.5	263 40 18.0	2 55 18.0	16 9.2	59 10.98	1.360	8.3	5	L	18 49.6	2.56
6.0	270 45 1.4	2 22 25.8	16 13.5	59 26.77	1.267	8.8	6	U	7 20.4	2.56
6.5	277 53 14.1	1 47 5.1	16 17.4	59 41.24	1.141	9.3	6	L	19 51.0	2.53
7.0	285 4 43.0	1 9 47.3	16 20.9	59 54.03	0.981	9.8	7	U	8 21.2	2.49
7.5	292 19 9.8	−0 31 8.3	16 23.8	60 4.66	+0.788	10.3	7	L	20 50.8	2.43
8.0	299 36 9.6	+0 8 13.0	16 26.0	60 12.81	+0.563	10.8	8	U	9 19.5	2.36

GREENWICH MEAN TIME.

G. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.			Var. per Hour.
	° ′ ″	° ′ ″	′ ″	′ ″	″	d			h m	m
ept. 8.0	299 36 9.6	+0 8 13.0	16 26.0	60 12.81	+0.563	10.8	Sept. 8	U	9 19.5	2 36
8.5	306 55 11.0	0 47 35.1	16 27.4	60 18.05	0.308	11.3	8	L	21 47.5	2.30
9.0	314 15 35.9	1 26 14.7	16 28.0	60 20.10	+0.030	11.8	9	U	10 14.7	2.24
9.5	321 36 40.6	2 3 29.1	16 27.6	60 18.72	−0.262	12.3	9	L	22 41.2	2.18
10.0	328 57 36.2	2 38 36.8	16 26.3	60 13.78	0.560	12.8	10	U	11 7.0	2.12
10.5	336 17 30.8	+3 10 59.3	16 24.0	60 5.27	−0.856	13.3	10	L	23 32.2	2.09
11.0	343 35 30.4	3 40 2.8	16 20.7	59 53.29	1.137	13.8	11	U	11 57.2	2.07
11.5	350 50 41.7	4 5 19.0	16 16.6	59 38.08	1.393	14.3			. . . . . .	. . .
12.0	358 2 13.9	4 26 26.5	16 11.6	59 19.98	1.618	14.8	12	L	0 21.8	2.04
12.5	5 9 20.8	4 43 10.2	16 6.0	58 59.39	1.806	15.3	12	U	12 46.3	2.04
13.0	12 11 22.9	+4 55 22.3	15 59.8	58 36.81	−1.950	15.8	13	L	1 10.8	2.04
13.5	19 7 48.2	5 3 1.3	15 53.3	58 12.77	2.047	16.3	13	U	13 35.4	2.05
14.0	25 58 13.4	5 6 11.4	15 46.5	57 47.85	2.099	16.8	14	L	2 0.1	2.07
14.5	32 42 24.5	5 5 1.8	15 39.6	57 22.58	2.107	17.3	14	U	14 25.1	2.09
15.0	39 20 16.9	4 59 45.2	15 32.8	56 57.46	2.072	17.8	15	L	2 50.4	2.12
15.5	45 51 54.3	+4 50 37.4	15 26.1	56 33.01	−1.998	18.3	15	U	15 15.9	2.13
16.0	52 17 28.4	4 37 55.9	15 19.8	56 9.63	1.890	18.8	16	L	3 41.6	2.15
16.5	58 37 18.4	4 21 59.4	15 13.8	55 47.75	1.754	19.3	16	U	16 7.6	2.17
17.0	64 51 49.6	4 3 7.0	15 8.3	55 27.64	1.595	19.8	17	L	4 33.6	2.17
17.5	71 1 31.4	3 41 37.9	15 3.4	55 9.56	1.415	20.3	17	U	16 59.7	2.17
18.0	77 6 58.1	+3 17 51.0	14 59.1	54 53.75	−1.219	20.8	18	L	5 25.6	2.15
18.5	83 8 46.9	2 52 4.8	14 55.4	54 40.34	1.014	21.3	18	U	17 51.3	2.13
19.0	89 7 36.2	2 24 37.2	14 52.4	54 29.42	0.803	21.8	19	L	6 16.7	2.09
19.5	95 4 6.8	1 55 45.8	14 50.2	54 21.08	0.589	22.3	19	U	18 41.6	2.06
20.0	100 58 58.9	1 25 47.8	14 48.6	54 15.30	0.375	22.8	20	L	7 6.1	2.02
20.5	106 52 53.4	+0 55 0.0	14 47.7	54 12.07	−0.164	23.3	20	U	19 30.0	1.97
21.0	112 46 30.0	+0 23 39.5	14 47.5	54 11.34	+0.040	23.8	21	L	7 53.4	1.92
21.5	118 40 27.0	−0 7 56.5	14 48.0	54 13.00	0.234	24.3	21	U	20 16.2	1.88
22.0	124 35 21.3	0 39 30.8	14 49.0	54 16.93	0.417	24.8	22	L	8 38.6	1.84
22.5	130 31 46.8	1 10 45.3	14 50.7	54 22.97	0.588	25.3	22	U	21 0.5	1.81
23.0	136 30 15.1	−1 41 21.4	14 52.8	54 30.95	+0.742	25.8	23	L	9 22.1	1.79
23.5	142 31 14.7	2 11 0.3	14 55.5	54 40.71	0.879	26.3	23	U	21 43.4	1.77
24.0	148 35 9.7	2 39 21.9	14 58.6	54 51.99	0.998	26.8	24	L	10 4.5	1.75
24.5	154 42 21.3	3 6 6.1	15 2.0	55 4.59	1.099	27.3	24	U	22 25.5	1.75
25.0	160 53 5.4	3 30 52.4	15 5.8	55 18.29	1.179	27.8	25	L	10 46.6	1.77
25.5	167 7 34.2	−3 53 20.2	15 9.7	55 32.80	+1.239	28.3	25	U	23 7.9	1.78
26.0	173 25 54.8	4 13 9.3	15 13.8	55 47.96	1.282	28.8	26	L	11 29.4	1.81
26.5	179 48 10.4	4 30 0.1	15 18.1	56 3.50	1.305	29.3	26	U	23 51.4	1.85
27.0	186 14 19.5	4 43 34.5	15 22.4	56 19.20	1.311	0.2	27	L	12 13.8	1.89
27.5	192 44 16.5	4 53 36.2	15 26.6	56 34.90	1.302	0.7			. . . . . .	. . .
28.0	199 17 52.7	−4 59 51.1	15 30.9	56 50.40	+1.280	1.2	28	U	0 36.9	1.96
28.5	205 54 56.7	5 2 8.1	15 35.0	57 5.58	1.247	1.7	28	L	13 0.8	2.03
29.0	212 35 14.8	5 0 19.5	15 39.0	57 20.29	1.205	2.2	29	U	1 25.6	2.10
29.5	219 18 32.3	4 54 21.1	15 42.9	57 34.45	1.156	2.7	29	L	13 51.3	2.18
30.0	226 4 34.3	4 44 12.9	15 46.6	57 48.03	1.103	3.2	30	U	2 18.0	2.26
30.5	232 53 6.2	−4 29 58.8	15 50.1	58 0.94	+1.049	3.7	30	L	14 45.6	2.34
1.0	239 43 54.7	−4 11 47.2	15 53.4	58 13.17	+0.993	4.2	Oct. 1	U	3 14.2	2.41

MOON, 1916.

GREENWICH MEAN TIME.

G. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.			Var. per Hour.
	° ′ ″	° ′ ″	′ ″	′ ″	″	d			h m	m
Oct. 1.0	239 43 51.7	−4 11 47.2	15 53.4	58 13.17	+0.993	4.2	Oct. 1	U	3 14.2	2.41
1.5	246 36 48.2	3 49 50.3	15 56.6	58 24.71	0.932	4.7	1	L	15 43.5	2.47
2.0	253 31 36.6	3 24 24.6	15 59.5	58 35.54	0.870	5.2	2	U	4 13.4	2.50
2.5	260 28 12.6	2 55 50.1	16 2.2	58 45.62	0.808	5.7	2	L	16 43.6	2.52
3.0	267 26 29.9	2 24 30.4	16 4.8	58 54.93	0.741	6.2	3	U	5 13.9	2.52
3.5	274 26 24.1	−1 50 52.3	16 7.1	59 3.36	+0.666	6.7	3	L	17 44.0	2.49
4.0	281 27 51.0	1 15 25.6	16 9.1	59 10.88	0.584	7.2	4	U	6 13.7	2.45
4.5	288 30 46.6	0 38 42.2	16 10.9	59 17.33	0.491	7.7	4	L	18 42.8	2.39
5.0	295 35 5.4	−0 1 16.3	16 12.3	59 22.61	0.385	8.2	5	U	7 11.2	2.33
5.5	302 40 40.6	+0 36 16.5	16 13.4	59 26.52	0.265	8.7	5	L	19 38.8	2.27
6.0	309 47 21.8	+1 13 19.8	16 14.0	59 28.90	+0.130	9.2	6	U	8 5.7	2.22
6.5	316 54 55.0	1 49 16.9	16 14.2	59 29.56	−0.021	9.7	6	L	20 32.2	2.15
7.0	324 3 2.0	2 23 31.8	16 13.9	59 28.32	0.186	10.2	7	U	8 57.4	2.09
7.5	331 11 19.8	2 55 30.1	16 13.0	59 25.04	0.362	10.7	7	L	21 22.4	2.07
8.0	338 19 20.7	3 24 39.9	16 11.5	59 19.61	0.547	11.2	8	U	9 47.0	2.04
8.5	345 26 33.4	+3 50 32.5	16 9.4	59 11.90	−0.736	11.7	8	L	22 11.3	2.02
9.0	352 32 22.3	4 12 43.7	16 6.7	59 1.94	0.923	12.2	9	U	10 35.5	2.02
9.5	359 36 10.4	4 30 54.0	16 3.4	58 49.79	1.103	12.7	9	L	22 59.8	2.02
10.0	6 37 19.9	4 44 49.7	15 59.5	58 35.52	1.270	13.2	10	U	11 24.1	2.03
10.5	13 35 13.8	4 54 22.6	15 55.1	58 19.39	1.418	13.7	10	L	23 48.6	2.06
11.0	20 29 17.5	+4 59 30.4	15 50.2	58 1.61	−1.542	14.2	11	U	12 13.5	2.09
11.5	27 19 0.4	5 0 15.9	15 45.0	57 42.49	1.639	14.7			. . . . .	. . .
12.0	34 3 57.4	4 56 47.1	15 39.6	57 22.39	1.705	15.2	12	L	0 38.7	2.11
12.5	40 43 49.9	4 49 16.1	15 33.9	57 1.70	1.738	15.7	12	U	13 4.2	2.14
13.0	47 18 25.7	4 37 58.1	15 28.2	56 40.82	1.738	16.2	13	L	1 30.0	2.17
13.5	53 47 40.5	+4 23 11.1	15 22.6	56 20.11	−1.705	16.7	13	U	13 56.2	2.19
14.0	60 11 37.0	4 5 14.8	15 17.1	56 0.00	1.640	17.2	14	L	2 22.6	2.20
14.5	66 30 24.7	3 44 29.8	15 11.9	55 40.85	1.546	17.7	14	U	14 49.0	2.20
15.0	72 44 20.3	3 21 16.9	15 7.0	55 23.01	1.425	18.2	15	L	3 15.4	2.19
15.5	78 53 45.7	2 55 57.1	15 2.6	55 6.74	1.281	18.7	15	U	15 41.7	2.17
16.0	84 59 8.1	+2 28 51.0	14 58.7	54 52.36	−1.115	19.2	16	L	4 7.6	2.14
16.5	91 0 59.1	2 0 18.1	14 55.3	54 40.06	0.932	19.7	16	U	16 33.1	2.11
17.0	96 59 54.0	1 30 37.7	14 52.6	54 30.03	0.735	20.2	17	L	4 58.2	2.06
17.5	102 56 30.4	1 0 8.0	14 50.5	54 22.46	0.528	20.7	17	U	17 22.6	2.01
18.0	108 51 28.4	+0 29 6.8	14 49.2	54 17.42	0.313	21.2	18	L	5 46.4	1.96
18.5	114 45 29.4	−0 2 8.8	14 48.5	54 14.96	−0.094	21.7	18	U	18 9.7	1.92
19.0	120 39 15.5	0 33 21.6	14 48.6	54 15.16	+0.126	22.2	19	L	6 32.4	1.87
19.5	126 33 28.8	1 4 15.0	14 49.3	54 17.97	0.342	22.7	19	U	18 54.5	1.82
20.0	132 28 50.7	1 34 31.9	14 50.8	54 23.35	0.553	23.2	20	L	7 16.2	1.79
20.5	138 26 1.6	2 3 55.1	14 52.9	54 31.20	0.755	23.7	20	U	19 37.6	1.77
21.0	144 25 40.2	−2 32 6.9	14 55.7	54 41.42	+0.946	24.2	21	L	7 58.7	1.75
21.5	150 28 22.2	2 58 49.1	14 59.1	54 53.84	1.120	24.7	21	U	20 19.7	1.75
22.0	156 34 40.3	3 23 43.0	15 3.0	55 8.22	1.275	25.2	22	L	8 40.7	1.75
22.5	162 45 3.2	3 46 29.1	15 7.4	55 24.35	1.409	25.7	22	U	21 1.7	1.76
23.0	168 59 54.7	4 6 47.7	15 12.2	55 41.94	1.517	26.2	23	L	9 23.0	1.79
23.5	175 19 33.5	−4 24 19.2	15 17.3	56 0.66	+1.599	26.7	23	U	21 44.7	1.83
24.0	181 44 12.1	−4 38 44.2	15 22.6	56 20.20	+1.651	27.2	24	L	10 6.9	1.88

GREENWICH MEAN TIME.

. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.			Var. per Hour.
	° ′ ″	° ′ ″	′ ″	′ ″	″	d			h m	m
t. 24.0	181 44 12.1	−4 38 44.2	15 22 6	56 20.20	+1.651	27.2	Oct. 24	L	10 6.9	1.88
24.5	188 13 56.3	4 49 44.2	15 28.1	56 40.18	1.673	27.7	24	U	22 29.8	1.94
25.0	194 48 45.4	4 57 2.5	15 33.5	57 0.24	1.665	28.2	25	L	10 53.4	2.00
25.5	201 28 31 9	5 0 24.0	15 38.9	57 19.99	1.624	28.7	25	U	23 17.9	2.08
26.0	208 13 1.3	4 59 37.4	15 44.1	57 39.09	1.553	29.2	26	L	11 43.4	2.17
26.5	215 1 53.2	−4 54 35.0	15 49.0	57 57.14	+1.454	0.1			. . . . .	. . .
27.0	221 54 42.1	4 45 13.2	15 53.6	58 13.89	1.333	0.6	27	U	0 10.0	2.26
27.5	228 50 58.2	4 31 34.1	15 57.8	58 29.08	1.193	1.1	27	L	12 37.6	2.34
28.0	235 50 8.9	4 13 44.5	16 1.4	58 42.47	1.037	1.6	28	U	1 6.2	2.42
28.5	242 51 40.7	3 51 57.3	16 4.5	58 53.91	0.872	2.1	28	L	13 35.8	2.49
29.0	249 54 59.9	−3 26 29.9	16 7.1	59 3.36	+0.702	2.6	29	U	2 6.0	2.53
29.5	256 59 34.4	2 57 45.1	16 9.1	59 10.80	0.534	3.1	29	L	14 36.7	2.57
30.0	264 4 55.0	2 26 10.0	16 10.6	59 16.22	0.372	3.6	30	U	3 7.6	2.57
30.5	271 10 35.8	1 52 15.0	16 11.6	59 19.74	0.218	4.1	30	L	15 38.3	2.54
31.0	278 16 15.0	1 16 33.3	16 12.0	59 21.48	+0.075	4.6	31	U	4 8.5	2.49
31.5	285 21 35.3	−0 39 40.1	16 12.0	59 21.57	−0.057	5.1	31	L	16 38.1	2.43
v. 1.0	292 26 22.9	−0 2 11.3	16 11.7	59 20.16	0.176	5.6	Nov. 1	U	5 6.9	2.36
1.5	299 30 27.7	+0 35 16.9	16 10.9	59 17.39	0.283	6.1	1	L	17 34.8	2.29
2.0	306 33 42.0	1 12 8.8	16 9.8	59 13.42	0.379	6.6	2	U	6 1.8	2.22
2.5	313 36 0.2	1 47 49.8	16 8.4	59 8.34	0.466	7.1	2	L	18 28.0	2.15
3.0	320 37 17.3	+2 21 46.9	16 6.8	59 2.25	−0.548	7.6	3	U	6 53.4	2.08
3.5	327 37 28.5	2 53 29.7	16 4.9	58 55.19	0.625	8.1	3	L	19 18.1	2.04
4.0	334 36 27.8	3 22 29.9	16 2.7	58 47.24	0.700	8.6	4	U	7 42.3	2.00
4.5	341 34 7.8	3 48 22.5	16 0.3	58 38.40	0.775	9.1	4	L	20 6.2	1.98
5.0	348 30 18.8	4 10 46.0	15 57.6	58 28.64	0.850	9.6	5	U	8 29.9	1.97
5.5	355 24 48.8	+4 29 22.7	15 54.7	58 18.00	−0.924	10.1	5	L	20 53.5	1.97
6.0	2 17 23.6	4 43 58.8	15 51.6	58 6.48	0.998	10.6	6	U	9 17.1	1.97
6.5	9 7 46.7	4 54 24.8	15 48.2	57 54.05	1.072	11.1	6	L	21 40.9	1.99
7.0	15 55 40.4	5 0 35.7	15 44.6	57 40.77	1.143	11.6	7	U	10 5.0	2.02
7.5	22 40 45.6	5 2 31.0	15 40.7	57 26.65	1.207	12.1	7	L	22 29.5	2.06
8.0	29 22 43.8	+5 0 14.5	15 36.7	57 11.83	−1.263	12.6	8	U	10 54.5	2.09
8.5	36 1 17.5	4 53 53.6	15 32.5	56 56.38	1.310	13.1	8	L	23 19.8	2.13
9.0	42 36 10.5	4 43 40.0	15 28.1	56 40.45	1.343	13.6	9	U	11 45.6	2.16
9.5	49 7 10.2	4 29 48.3	15 23.7	56 24.21	1.360	14.1			. . . . .	. . .
10.0	55 34 7.1	4 12 35.7	15 19.3	56 7.88	1.358	14.6	10	L	0 11.7	2.19
10.5	61 56 56.1	+3 52 21.5	15 14.9	55 51.70	−1.337	15.1	10	U	12 38.1	2.21
11.0	68 15 36.5	3 29 26.1	15 10.5	55 35.88	1.294	15.6	11	L	1 4.7	2.22
11.5	74 30 12.6	3 4 11.3	15 6.4	55 20.71	1.230	16.1	11	U	13 31.3	2.20
12.0	80 40 53.9	2 36 58.9	15 2.5	55 6.43	1.146	16.6	12	L	1 57.6	2.18
12.5	86 47 54.4	2 8 10.5	14 58.9	54 53.31	1.040	17.1	12	U	14 23.7	2.15
13.0	92 51 32.7	+1 38 7.7	14 55.7	54 41.57	−0.913	17.6	13	L	2 49.3	2.11
13.5	98 52 11.6	1 7 11.0	14 53.0	54 31.46	0.767	18.1	13	U	15 14.4	2.06
14.0	104 50 18.5	0 35 40.2	14 50.8	54 23.22	0.604	18.6	14	L	3 38.8	2.01
14.5	110 46 23.6	+0 3 54.6	14 49.1	54 17.03	0.425	19.1	14	U	16 2.6	1.95
15.0	116 41 0.6	−0 27 47.7	14 48.0	54 13.06	0.234	19.6	15	L	4 25.7	1.90
15.5	122 34 45.4	−0 59 8.9	14 47.5	54 11.46	−0.032	20.1	15	U	16 48.2	1.85
16.0	128 28 16.4	−1 29 52.2	14 47.8	54 12.33	+0.179	20.6	16	L	5 10.2	1.81

GREENWICH MEAN TIME.

G. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.			Var. per Hour.
	° ′ ″	° ′ ″	′ ″	′ ″	″	d			h m	m
Nov. 16.0	128 28 16.4	−1 29 52.2	14 47.8	54 12.33	+0.179	20.6	Nov. 16	L	5 10.2	1.81
16.5	134 22 13.0	1 59 40.7	14 48.7	54 15.77	0.395	21.1	16	U	17 31.6	1.77
17.0	140 17 16.3	2 28 18.0	14 50.4	54 21.82	0.614	21.6	17	L	5 52.7	1.74
17.5	146 14 7.1	2 55 27.7	14 52.7	54 30.50	0.832	22.1	17	U	18 13.5	1.73
18.0	152 13 26.5	3 20 53.1	14 55.8	54 41.78	1.045	22.6	18	L	6 34.2	1.72
18.5	158 15 54.3	−3 44 17.1	14 59.6	54 55.57	+1.250	23.1	18	U	18 54.8	1.72
19.0	164 22 9.1	4 5 22.5	15 4.0	55 11.74	1.443	23.6	19	L	7 15.6	1.74
19.5	170 32 46.5	4 23 51.6	15 9.0	55 30.14	1.619	24.1	19	U	19 36.6	1.77
20.0	176 48 18.9	4 39 26.5	15 14.5	55 50.51	1.773	24.6	20	L	7 58.1	1.81
20.5	183 9 14.4	4 51 49.2	15 20.6	56 12.60	1.902	25.1	20	U	20 20.1	1.86
21.0	189 35 55.4	−5 0 42.2	15 26.9	56 36.03	+1.999	25.6	21	L	8 42.8	1.92
21.5	196 8 37.8	5 5 49.0	15 33.6	57 0.41	2.059	26.1	21	U	21 6.3	2.00
22.0	202 47 30.2	5 6 54.5	15 40.4	57 25.29	2.080	26.6	22	L	9 30.9	2.09
22.5	209 32 33.2	5 3 46.4	15 47.2	57 50.17	2.058	27.1	22	U	21 56.6	2.19
23.0	216 23 38.2	4 56 15.5	15 53.8	58 14.51	1.991	27.6	23	L	10 23.4	2.29
23.5	223 20 28.3	−4 44 17.1	16 0.1	58 37.77	+1.879	28.1	23	U	22 51.5	2.39
24.0	230 22 36.9	4 27 51.8	16 6.0	58 59.42	1.723	28.6	24	L	11 20.8	2.48
24.5	237 29 30.3	4 7 6.3	16 11.3	59 18.93	1.525	29.1	24	U	23 51.1	2.56
25.0	244 40 27.1	3 42 13.8	16 16.0	59 35.87	1.292	0.1	25	L	12 22.3	2.62
25.5	251 54 41.2	3 13 34.0	16 19.8	59 49.84	1.032	0.6			. . . . .	. . .
26.0	259 11 22.4	−2 41 33.3	16 22.7	60 0.58	+0.753	1.1	26	U	0 54.0	2.64
26.5	266 29 39.4	2 6 44.2	16 24.7	60 7.90	0.465	1.6	26	L	13 25.8	2.64
27.0	273 48 41.1	1 29 43.3	16 25.7	60 11.74	+0.178	2.1	27	U	1 57.5	2.62
27.5	281 7 38.8	0 51 11.3	16 25.8	60 12.22	−0.099	2.6	27	L	14 28.6	2.56
28.0	288 25 48.1	−0 11 50.2	16 25.1	60 9.44	0.358	3.1	28	U	2 58.9	2.49
28.5	295 42 29.7	+0 27 36.6	16 23.5	60 3.70	−0.591	3.6	28	L	15 28.3	2.40
29.0	302 57 9.9	1 6 27.8	16 21.3	59 55.38	0.795	4.1	29	U	3 56.6	2.32
29.5	310 9 21.8	1 44 3.1	16 18.4	59 44.77	0.966	4.6	29	L	16 23.9	2.23
30.0	317 18 44.2	2 19 46.2	16 15.0	59 32.32	1.105	5.1	30	U	4 50.2	2.15
30.5	324 25 1.8	2 53 4.4	16 11.2	59 18.39	1.211	5.6	30	L	17 15.6	2.08
Dec. 1.0	331 28 4.2	+3 23 28.9	16 7.1	59 3.35	−1.288	6.1	Dec. 1	U	5 40.2	2.03
1.5	338 27 45.2	3 50 35.6	16 2.8	58 47.57	1.340	6.6	1	L	18 4.3	1.99
2.0	345 24 2.0	4 14 4.9	15 58.4	58 31.29	1.368	7.1	2	U	6 28.0	1.96
2.5	352 16 54.1	4 33 41.5	15 53.9	58 14.80	1.378	7.6	2	L	18 51.4	1.95
3.0	359 6 22.5	4 49 14.4	15 49.4	57 58.27	1.374	8.1	3	U	7 14.7	1.94
3.5	5 52 29.1	+5 0 36.5	15 44.9	57 41.87	−1.360	8.6	3	L	19 38.1	1.95
4.0	12 35 16.5	5 7 44.6	15 40.5	57 25.66	1.339	9.1	4	U	8 1.6	1.97
4.5	19 14 46.5	5 10 39.0	15 36.1	57 9.75	1.313	9.6	4	L	20 25.4	1.99
5.0	25 51 0.9	5 9 23.3	15 31.9	56 54.16	1.284	10.1	5	U	8 49.5	2.03
5.5	32 24 1.4	5 4 4.3	15 27.7	56 38.95	1.254	10.6	5	L	21 14.1	2.07
6.0	38 53 49.0	+4 54 51.9	15 23.7	56 24.08	−1.223	11.1	6	U	9 39.1	2.10
6.5	45 20 24.2	4 41 58.2	15 19.7	56 9.61	1.189	11.6	6	L	22 4.6	2.14
7.0	51 43 47.9	4 25 37.8	15 15.9	55 55.53	1.155	12.1	7	U	10 30.4	2.17
7.5	58 4 1.3	4 6 7.6	15 12.2	55 41.90	1.119	12.6	7	L	22 56.6	2.19
8.0	64 21 6.1	3 43 46.0	15 8.6	55 28.71	1.078	13.1	8	U	11 22.9	2.19
8.5	70 35 5.2	+3 18 52.8	15 5.1	55 16.05	−1.031	13.6	8	L	23 49.3	2.19
9.0	76 46 3.1	+2 51 48.8	15 1.9	55 4.00	−0.976	14.1	9	U	12 15.5	2.17

GREENWICH MEAN TIME.

G. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.			Var. per Hour.
	° ′ ″	° ′ ″	′ ″	′ ″	″	d			h m	m
ec. 9.0	76 46 3.1	+2 51 48.8	15 1.9	55 4.00	−0.976	14.1	Dec. 9	U	12 15.5	2.17
9.5	82 54 6.1	2 22 55.4	14 58.8	54 52.66	0.912	14.6			. . . . .	. . .
10.0	88 59 22.9	1 52 34.5	14 55.9	54 42.14	0.839	15.1	10	L	0 41.4	2.14
10.5	95 2 4.2	1 21 7.8	14 53.3	54 32.58	0.753	15.6	10	U	13 6.9	2.10
11.0	101 2 23.5	0 48 56.8	14 51.0	54 24.13	0.654	16.1	11	L	1 31.9	2.05
11.5	107 0 37.1	+0 16 22.4	14 49.0	54 16.93	−0.542	16.6	11	U	13 56.2	2.00
12.0	112 57 4.0	−0 16 15.1	14 47.5	54 11.17	0.416	17.1	12	L	2 19.9	1.94
12.5	118 52 5.4	0 48 36.1	14 46.3	54 7.01	0.276	17.6	12	U	14 42.9	1.89
13.0	124 46 6.3	1 20 21.7	14 45.7	54 4.61	−0.122	18.1	13	L	3 5.3	1.84
13.5	130 39 33.5	1 51 14.2	14 45.6	54 4.14	+0.045	18.6	13	U	15 27.1	1.79
14.0	136 32 56.2	−2 20 56.2	14 46.0	54 5.75	+0.224	19.1	14	L	3 48.3	1.75
14.5	142 26 46.3	2 49 11.2	14 47.0	54 9.58	0.414	19.6	14	U	16 9.2	1.72
15.0	148 21 37.3	3 15 43.1	14 48.7	54 15.71	0.612	20.1	15	L	4 29.7	1.70
15.5	154 18 4.4	3 40 16.0	14 51.0	54 24.28	0.817	20.6	15	U	16 50.1	1.69
16.0	160 16 44.0	4 2 34.6	14 54.0	54 35.33	1.026	21.1	16	L	5 10.4	1.69
16.5	166 18 13.4	−4 22 23.4	14 57.7	54 48.89	+1.236	21.6	16	U	17 30.8	1.71
17.0	172 23 10.0	4 39 27.2	15 2.1	55 4.97	1.442	22.1	17	L	5 51.4	1.73
17.5	178 32 10.5	4 53 30.6	15 7.2	55 23.45	1.640	22.6	17	U	18 12.3	1.77
18.0	184 45 50.7	5 4 18.6	15 12.8	55 44.27	1.826	23.1	18	L	6 33.8	1.82
18.5	191 4 44.2	5 11 36.2	15 19.1	56 7.22	1.996	23.6	18	U	18 56.0	1.88
19.0	197 29 21.2	−5 15 9.2	15 25.9	56 32.08	+2.142	24.1	19	L	7 19.0	1.96
19.5	204 0 7.6	5 14 44.0	15 33.1	56 58.52	2.258	24.6	19	U	19 43.0	2.04
20.0	210 37 24.3	5 10 9.3	15 40.6	57 26.13	2.339	25.1	20	L	8 8.1	2.14
20.5	217 21 25.1	5 1 15.8	15 48.3	57 54.48	2.376	25.6	20	U	20 34.5	2.25
21.0	224 12 16.0	4 47 57.5	15 56.1	58 22.96	2.365	26.1	21	L	9 2.2	2.36
21.5	231 9 54.0	−4 30 12.7	16 3.7	58 51.01	+2.300	26.6	21	U	21 31.2	2.47
22.0	238 14 6.7	4 8 5.4	16 11.1	59 17.94	2.178	27.1	22	L	10 1.4	2.56
22.5	245 24 30.8	3 41 45.7	16 17.9	59 43.07	1.998	27.6	22	U	22 32.6	2.63
23.0	252 40 33.2	3 11 30.4	16 24.1	60 5.68	1.763	28.1	23	L	11 4.6	2.68
23.5	260 1 31.1	2 37 44.0	16 29.4	60 25.16	1.477	28.6	23	U	23 37.0	2.69
24.0	267 26 32.7	−2 0 58.4	16 33.7	60 40.95	+1.146	29.1	24	L	12 9.3	2.68
24.5	274 54 39.6	1 21 51.8	16 36.8	60 52.54	0.783	0.1			. . . . .	. . .
25.0	282 24 48.3	−0 41 8.2	16 38.8	60 59.66	0.401	0.6	25	U	0 41.3	2.64
25.5	289 55 53.1	+0 0 24.7	16 39.5	61 2.14	+0.013	1.1	25	L	13 12.6	2.57
26.0	297 26 47.5	0 41 57.5	16 38.9	61 0.02	−0.366	1.6	26	U	1 43.0	2.49
26.5	304 56 28.0	+1 22 40.8	16 37.1	60 53.46	−0.722	2.1	26	L	14 12.3	2.39
27.0	312 23 55.5	2 1 47.7	16 34.2	60 42.84	1.043	2.6	27	U	2 40.5	2.31
27.5	319 48 17.5	2 38 35.3	16 30.3	60 28.60	1.322	3.1	27	L	15 7.7	2.22
28.0	327 8 48.9	3 12 26.1	16 25.6	60 11.29	1.553	3.6	28	U	3 33.9	2.15
28.5	334 24 53.2	3 42 49.3	16 20.2	59 51.51	1.733	4.1	28	L	15 59.3	2.09
29.0	341 36 3.2	+4 9 20.0	16 14.3	59 29.89	−1.863	4.6	29	U	4 24.1	2.04
29.5	348 41 59.7	4 31 40.4	16 8.1	59 6.99	1.945	5.1	29	L	16 48.3	2.00
30.0	355 42 31.3	4 49 38.9	16 1.6	58 43.41	1.982	5.6	30	U	5 12.2	1.98
30.5	2 37 34.3	5 3 9.4	15 55.2	58 19.60	1.980	6.1	30	L	17 35.9	1.97
31.0	9 27 10.9	5 12 10.7	15 48.7	57 56.00	1.948	6.6	31	U	5 59.6	1.98
31.5	16 11 28.1	+5 16 45.8	15 42.4	57 32.94	−1.890	7.1	31	L	18 23.4	1.99

GREENWICH MEAN TIME.

Date.		Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit Meridian of Greenwich.
		Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
		h m s	s	° ′ ″	″			″	″	h m
Jan.	1	19 25 8.05	+17.640	−24 11 13.2	+34.68	0.130 8872	−1530.9	2.47	6.51	0 46.
	2	19 32 10.66	17.576	23 56 33.8	38.61	0.127 0725	1649.0	2.49	6.57	0 49.
	3	19 39 11.53	17.494	23 40 20.1	42.53	0.122 9668	1773.4	2.52	6.63	0 52.
	4	19 46 10.22	17.394	23 22 32.8	46.42	0.118 5547	1904.5	2.54	6.70	0 55.
	5	19 53 6.24	17.271	23 3 12.4	50.28	0.113 8197	2042.8	2.57	6.77	0 58.
	6	19 59 59.01	+17.123	−22 42 20.0	+54.08	0.108 7441	−2188.4	2.60	6.85	1 1.
	7	20 6 47.92	16.948	22 19 57.3	57.80	0.103 3090	2342.3	2.63	6.94	1 4.
	8	20 13 32.24	16.741	21 56 6.2	61.43	0.097 4945	2504.7	2.67	7.03	1 6.
	9	20 20 11.19	16.498	21 30 49.6	64.93	0.091 2797	2675.8	2.71	7.13	1 9.
	10	20 26 43.84	16.215	21 4 11.0	68.26	0.084 6432	2856.1	2.75	7.24	1 12.
	11	20 33 9.17	+15.887	−20 36 14.7	+71.40	0.077 5629	−3045.7	2.79	7.36	1 14.
	12	20 39 26.01	15.507	20 7 6.1	74.29	0.070 0167	3244.3	2.84	7.49	1 17.
	13	20 45 33.04	15.069	19 36 51.7	76.86	0.061 9832	3451.7	2.90	7.63	1 19.
	14	20 51 28.78	14.564	19 5 39.6	79.08	0.053 4420	3667.2	2.95	7.78	1 21.
	15	20 57 11.54	13.986	18 33 39.0	80.89	0.044 3750	3889.5	3.02	7.94	1 22.
	16	21 2 39.45	+13.326	−18 1 1.0	+82.19	0.034 7676	−4117.2	3.08	8.12	1 24.
	17	21 7 50.43	12.574	17 27 58.7	82.90	0.024 6101	4347.6	3.16	8.32	1 25.
	18	21 12 42.16	11.720	16 54 46.9	82.96	0.013 8994	4577.5	3.23	8.52	1 26.
	19	21 17 12.14	10.759	16 21 42.7	82.26	0.002 6416	4802.7	3.32	8.75	1 27.
	20	21 21 17.66	9.681	15 49 5.3	80.71	9.990 8541	5018.2	3.41	8.99	1 27.
	21	21 24 55.85	+ 8.481	−15 17 15.9	+78.24	9.978 5683	−5216.9	3.51	9.25	1 26.8
	22	21 28 3.75	7.157	14 46 37.6	74.78	9.965 8323	5391.8	3.61	9.52	1 25.9
	23	21 30 38.38	5.709	14 17 35.0	70.25	9.952 7141	5533.8	3.72	9.81	1 24.5
	24	21 32 36.82	4.143	13 50 34.1	64.65	9.939 3038	5633.5	3.84	10.12	1 22.5
	25	21 33 56.41	2.473	13 26 0.7	57.96	9.925 7154	5680.6	3.96	10.44	1 19.8
	26	21 34 34.85	+ 0.719	−13 4 20.2	+50.23	9.912 0880	−5664.2	4.09	10.77	1 16.6
	27	21 34 30.46	− 1.091	12 45 56.8	41.57	9.898 5858	5574.8	4.22	11.11	1 12.5
	28	21 33 42.33	2.919	12 31 11.1	32.12	9.885 3952	5403.3	4.35	11.46	1 7.8
	29	21 32 10.55	4.720	12 20 19.6	22.09	9.872 7207	5143.7	4.48	11.80	1 2.2
	30	21 29 56.39	6.441	12 13 33.4	11.74	9.860 7784	4793.0	4.60	12.13	0 56.1
	31	21 27 2.47	− 8.024	−12 10 56.9	+ 1.35	9.849 7861	−4352.6	4.72	12.44	0 49.2
Feb.	1	21 23 32.77	9.413	12 12 26.6	− 8.74	9.839 9529	3828.7	4.83	12.72	0 41.8
	2	21 19 32.61	10.555	12 17 51.5	18.20	9.831 4665	3232.6	4.92	12.97	0 33.9
	3	21 15 8.47	11.404	12 26 53.1	26.75	9.824 4812	2580.8	5.00	13.18	0 25.6
	4	21 10 27.75	11.933	12 39 6.1	34.13	9.819 1077	1893.0	5.06	13.35	0 17.0
	5	21 5 38.34	−12.128	−12 54 0.5	−40.17	9.815 4060	−1191.4	5.11	13.46	0 8.3 23 59.6
	6	21 0 48.24	11.993	13 11 3.1	44.80	9.813 3827	− 497.9	5.13	13.52	23 51.0
	7	20 56 5.10	11.553	13 29 39.8	48.01	9.812 9934	+ 167.0	5.14	13.54	23 42.6
	8	20 51 35.87	10.841	13 49 17.4	49.89	9.814 1482	786.4	5.12	13.50	23 34.5
	9	20 47 26.52	9.906	14 9 25.0	50.55	9.816 7216	1347.5	5.09	13.42	23 26.9
	10	20 43 41.85	− 8.792	−14 29 35.4	−50.16	9.820 5632	+1842.3	5.05	13.30	23 19.7
	11	20 40 25.46	7.556	14 49 25.5	48.87	9.825 5088	2267.2	4.99	13.15	23 13.0
	12	20 37 39.79	6.241	15 8 36.1	46.89	9.831 3900	2623.1	4.92	12.97	23 6.9
	13	20 35 26.20	4.889	15 26 52.0	44.35	9.838 0427	2911.0	4.85	12.78	23 1.2
	14	20 33 45.18	3.534	15 44 1.6	41.38	9.845 3131	3138.0	4.77	12.57	22 56.2
	15	20 32 36.48	− 2.199	−15 59 55.9	−38.10	9.853 0608	+3309.8	4.68	12.34	22 51.6
	16	20 31 59.28	− 0.909	−16 14 28.7	−34.60	9.861 1611	+3433.0	4.60	12.11	22 47.5

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h m
Feb. 16	20 31 59.28	− 0.909	−16 14 28.7	− 34.60	9.861 1611	+3433.0	4.60	12.11	22 47.5
17	20 31 52.39	+ 0.324	16 27 35.5	30.94	9.869 5061	3514.8	4.51	11.88	22 43.9
18	20 32 14.30	1.490	16 39 13.2	27.18	9.878 0042	3561.6	4.42	11.65	22 40.8
19	20 33 3.37	2.586	16 49 19.9	23.37	9.886 5784	3579.1	4.34	11.43	22 38.1
20	20 34 17.86	3.609	16 57 54.6	19.52	9.895 1648	3572.6	4.25	11.20	22 35.7
21	20 35 56.00	+ 4.558	−17 4 56.7	− 15.66	9.903 7118	+3546.1	4.17	10.98	22 33.8
22	20 37 56.08	5.437	17 10 26.2	11.80	9.912 1782	3506.1	4.09	10.77	22 32.2
23	20 40 16.43	6.248	17 14 23.3	7.97	9.920 5313	3453.1	4.01	10.57	22 30.9
24	20 42 55.45	6.994	17 16 48.4	4.14	9.928 7456	3390.9	3.94	10.37	22 29.8
25	20 45 51.65	7.680	17 17 42.1	− 0.35	9.936 8022	3322.0	3.86	10.18	22 29.1
26	20 49 3.63	+ 8.310	−17 17 5.2	+ 3.42	9.944 6871	+3248.1	3.79	10.00	22 28.6
27	20 52 30.09	8.887	17 14 58.4	7.15	9.952 3904	3171.2	3.73	9.82	22 28.3
28	20 56 9.83	9.417	17 11 22.4	10.85	9.959 9054	3091.4	3.66	9.65	22 28.2
29	21 0 1.75	9.903	17 6 18.1	14.51	9.967 2284	3011.0	3.60	9.49	22 28.3
ar. 1	21 4 4.84	10.348	16 59 46.3	18.14	9.974 3578	2930.2	3.54	9.34	22 28.5
2	21 8 18.18	+10.757	−16 51 47.8	+ 21.73	9.981 2937	+2849.8	3.49	9.19	22 29.0
3	21 12 40.92	11.132	16 42 23.4	25.30	9.988 0376	2770.2	3.43	9.05	22 29.6
4	21 17 12.31	11.478	16 31 33.9	28.83	9.994 5919	2691.9	3.38	8.91	22 30.3
5	21 21 51.65	11.796	16 19 20.1	32.32	0.000 9598	2615.0	3.33	8.78	22 31.1
6	21 26 38.32	12.089	16 5 42.8	35.78	0.007 1451	2539.8	3.29	8.66	22 32.0
7	21 31 31.75	+12.360	−15 50 42.7	+ 39.22	0.013 1521	+2466.4	3.24	8.54	22 33.1
8	21 36 31.44	12.611	15 34 20.5	42.62	0.018 9851	2394.8	3.20	8.42	22 34.2
9	21 41 36.92	12.843	15 16 37.0	46.00	0.024 6484	2325.0	3.16	8.31	22 35.4
10	21 46 47.79	13.060	14 57 32.8	49.35	0.030 1465	2257.1	3.12	8.21	22 36.8
11	21 52 3.69	13.263	14 37 8.6	52.67	0.035 4838	2191.0	3.08	8.11	22 38.2
12	21 57 24.30	+13.453	−14 15 25.0	+ 55.96	0.040 6646	+2126.6	3.04	8.01	22 39.6
13	22 2 49.33	13.632	13 52 22.7	59.23	0.045 6929	2063.8	3.01	7.92	22 41.2
14	22 8 18.53	13.800	13 28 2.4	62.46	0.050 5725	2002.7	2.97	7.83	22 42.8
15	22 13 51.68	13.961	13 2 24.7	65.68	0.055 3069	1942.9	2.94	7.75	22 44.5
16	22 19 28.61	14.115	12 35 30.2	68.86	0.059 8993	1884.3	2.91	7.67	22 46.2
17	22 25 9.16	+14.263	−12 7 19.5	+ 72.03	0.064 3524	+1826.8	2.88	7.59	22 48.0
18	22 30 53.21	14.407	11 37 53.3	75.16	0.068 6687	1770.3	2.85	7.51	22 49.8
19	22 36 40.64	14.546	11 7 12.1	78.27	0.072 8501	1714.4	2.82	7.44	22 51.7
20	22 42 31.38	14.683	10 35 16.6	81.35	0.076 8982	1659.1	2.80	7.37	22 53.7
21	22 48 25.39	14.818	10 2 7.5	84.40	0.080 8142	1604.2	2.77	7.31	22 55.7
22	22 54 22.63	+14.953	− 9 27 45.4	+ 87.43	0.084 5985	+1549.3	2.75	7.24	22 57.8
23	23 0 23.10	15.087	8 52 10.9	90.43	0.088 2509	1494.3	2.72	7.18	22 59.9
24	23 6 26.80	15.222	8 15 24.7	93.40	0.091 7710	1439.0	2.70	7.12	23 2.1
25	23 12 33.77	15.359	7 37 27.6	96.34	0.095 1574	1382.9	2.68	7.07	23 4.3
26	23 18 44.05	15.498	6 58 20.4	99.25	0.098 4082	1325.9	2.66	7.01	23 6.6
27	23 24 57.71	+15.641	− 6 18 3.9	+102.12	0.101 5208	+1267.7	2.64	6.96	23 8.9
28	23 31 14.84	15.787	5 36 39.0	104.95	0.104 4918	1207.8	2.63	6.92	23 11.3
29	23 37 35.53	15.938	4 54 6.8	107.73	0.107 3169	1146.0	2.61	6.87	23 13.8
30	23 43 59.90	16.094	4 10 28.3	110.47	0.109 9910	1081.9	2.59	6.83	23 16.3
31	23 50 28.07	16.255	3 25 44.8	113.15	0.112 5080	1015.1	2.58	6.79	23 18.9
r. 1	23 57 0.19	+16.423	− 2 39 57.7	+115.77	0.114 8609	+ 945.1	2.56	6.75	23 21.6
2	0 3 36.40	+16.596	− 1 53 8.4	+118.32	0.117 0415	+ 871.4	2.55	6.72	23 24.3

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Tra Meri c Gr wi
	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″			″	″	h
Apr. 1	23 57 0.19	+16.423	− 2 39 57.7	+115.77	0.114 8609	+ 945.1	2.56	6.75	23
2	0 3 36.40	16.596	1 53 8.4	118.32	0.117 0415	871.4	2.55	6.72	23
3	0 10 16.86	16.777	1 5 18.9	120.80	0.119 0404	793.6	2.54	6.69	23
4	0 17 1.74	16.964	− 0 16 31.1	123.18	0.120 8469	711.0	2.53	6.66	23
5	0 23 51.20	17.159	+ 0 33 12.8	125.46	0.122 4491	623.3	2.52	6.64	23
6	0 30 45.41	+17.360	+ 1 23 50.0	+127.62	0.123 8339	+ 529.8	2.51	6.62	23
7	0 37 44.51	17.567	2 15 17.4	129.64	0.124 9866	429.7	2.50	6.60	23
8	0 44 48.65	17.779	3 7 31.4	131.50	0.125 8906	322.4	2.50	6.59	23
9	0 51 57.96	17.997	4 0 28.0	133.18	0.126 5282	207.6	2.50	6.57	23
10	0 59 12.53	18.217	4 54 2.4	134.65	0.126 8805	+ 84.6	2.49	6.57	23
11	1 6 32.40	+18.439	+ 5 48 9.2	+135.88	0.126 9271	− 47.3	2.49	6.57	23
12	1 13 57.59	18.660	6 42 42.3	136.83	0.126 6462	188.4	2.50	6.57	23
13	1 21 28.04	18.877	7 37 34.6	137.47	0.126 0153	339.0	2.50	6.58	23
14	1 29 3.62	19.087	8 32 38.2	137.76	0.125 0113	499.3	2.50	6.60	. .
15	1 36 44.11	19.285	9 27 44.3	137.68	0.123 6111	669.2	2.51	6.62	0
16	1 44 29.20	+19.469	+10 22 43.3	+137.17	0.121 7918	− 848.5	2.52	6.65	0
17	1 52 18.47	19.633	11 17 24.6	136.19	0.119 5315	1036.5	2.54	6.68	0
18	2 0 11.38	19.772	12 11 36.8	134.73	0.116 8101	1232.5	2.55	6.72	0
19	2 8 7.28	19.881	13 5 7.9	132.77	0.113 6098	1435.4	2.57	6.77	0
20	2 16 5.38	19.955	13 57 45.4	130.27	0.109 9161	1643.4	2.59	6.83	0
21	2 24 4.80	+19.990	+14 49 16.7	+127.25	0.105 7185	−1855.0	2.62	6.90	0
22	2 32 4.53	19.981	15 39 29.1	123.70	0.101 0108	2068.2	2.65	6.97	0
23	2 40 3.49	19.925	16 28 10.3	119.65	0.095 7917	2280.8	2.68	7.06	0
24	2 48 0.51	19.819	17 15 8.7	115.14	0.090 0649	2490.9	2.71	7.15	0
25	2 55 54.40	19.663	18 0 13.5	110.19	0.083 8392	2696.2	2.75	7.25	0
26	3 3 43.93	+19.456	+18 43 15.0	+104.88	0.077 1283	−2894.9	2.80	7.37	0
27	3 11 27.88	19.200	19 24 5.1	99.25	0.069 9501	3085.4	2.84	7.49	0
28	3 19 5.06	18.892	20 2 37.0	93.38	0.062 3261	3266.2	2.89	7.62	0
29	3 26 34.31	18.538	20 38 45.5	87.31	0.054 2810	3436.2	2.95	7.77	0
30	3 33 54.53	18.140	21 12 26.7	81.11	0.045 8418	3594.5	3.01	7.92	1
May 1	3 41 4.68	+17.700	+21 43 38.3	+ 74.85	0.037 0369	−3740.8	3.07	8.08	1
2	3 48 3.79	17.220	22 12 19.3	68.57	0.027 8956	3874.8	3.13	8.25	1
3	3 54 50.96	16.705	22 38 29.8	62.32	0.018 4478	3996.3	3.20	8.43	1
4	4 1 25.36	16.157	23 2 11.0	56.13	0.008 7233	4105.5	3.27	8.62	1
5	4 7 46.22	15.577	23 23 24.7	50.03	9.998 7513	4202.6	3.35	8.83	1
6	4 13 52.81	+14.968	+23 42 13.7	+ 44.07	9.988 5605	−4287.8	3.43	9.03	1
7	4 19 44.45	14.332	23 58 41.2	38.25	9.978 1792	4361.3	3.51	9.25	1
8	4 25 20.52	13.670	24 12 50.7	32.58	9.967 6352	4423.4	3.60	9.48	1
9	4 30 40.41	12.984	24 24 46.1	27.07	9.956 9559	4474.2	3.69	9.72	1
10	4 35 43.57	12.276	24 34 31.6	21.74	9.946 1682	4513.7	3.78	9.96	1
11	4 40 29.45	+11.545	+24 42 11.2	+ 16.59	9.935 2990	−4542.1	3.88	10.21	1
12	4 44 57.53	10.793	24 47 49.3	11.61	9.924 3753	4559.1	3.97	10.47	1
13	4 49 7.32	10.020	24 51 29.9	6.80	9.913 4248	4564.4	4.08	10.74	1
14	4 52 58.34	9.229	24 53 17.3	+ 2.17	9.902 4759	4557.6	4.18	11.02	1
15	4 56 30.15	8.420	24 53 15.6	− 2.29	9.891 5582	4538.3	4.29	11.30	1
16	4 59 42.34	+ 7.594	+24 51 28.7	− 6.59	9.880 7026	−4505.8	4.40	11.58	1
17	5 2 34.54	+ 6.754	+24 48 0.5	− 10.73	9.869 9416	−4459.4	4.51	11.87	1

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h m
ay 17	5 2 34.54	+ 6.754	+24 48 0.5	−10.73	9.869 9416	−4459.4	4.51	11.87	1 23.1
18	5 5 6.44	5.902	24 42 54.9	14.71	9.859 3094	4398.2	4.62	12.17	1 21.7
19	5 7 17.76	5.040	24 36 15.7	18.53	9.848 8426	4321.4	4.73	12.46	1 19.9
20	5 9 8.31	4.172	24 28 6.7	22.19	9.838 5800	4227.9	4.84	12.76	1 17.8
21	5 10 37.99	3.301	24 18 31.6	25.70	9.828 5626	4116.9	4.96	13.06	1 15.3
22	5 11 46.79	+ 2.433	+24 7 34.2	−29.05	9.818 8339	−3987.2	5.07	13.35	1 12.5
23	5 12 34.82	1.571	23 55 18.6	32.22	9.809 4397	3838.0	5.18	13.65	1 9.4
24	5 13 2.32	+ 0.723	23 41 49.1	35.20	9.800 4279	3668.4	5.29	13.93	1 5.9
25	5 13 9.70	− 0.105	23 27 10.3	37.99	9.791 8484	3477.6	5.39	14.21	1 2.0
26	5 12 57.51	0.905	23 11 27.2	40.56	9.783 7525	3265.2	5.50	14.48	0 57.9
27	5 12 26.51	− 1.671	+22 54 45.3	−42.88	9.776 1925	−3031.1	5.59	14.73	0 53.4
28	5 11 37.65	2.392	22 37 10.9	44.92	9.769 2206	2775.2	5.68	14.97	0 48.7
29	5 10 32.09	3.061	22 18 50.9	46.68	9.762 8884	2498.2	5.77	15.19	0 43.7
30	5 9 11.21	3.668	21 59 52.8	48.09	9.757 2455	2200.9	5.84	15.39	0 38.4
31	5 7 36.59	4.205	21 40 25.4	49.13	9.752 3388	1885.0	5.91	15.56	0 32.9
ne 1	5 5 50.00	− 4.665	+21 20 38.0	−49.75	9.748 2107	−1552.5	5.96	15.71	0 27.2
2	5 3 53.38	5.039	21 0 40.8	49.94	9.744 8978	1206.0	6.01	15.83	0 21.3
3	5 1 48.86	5.323	20 40 44.6	49.66	9.742 4307	848.2	6.04	15.92	0 15.3
4	4 59 38.65	5.512	20 21 0.9	48.90	9.740 8326	482.5	6.07	15.98	0 9.2
5	4 57 25.05	5.605	20 1 41.5	47.64	9.740 1183	− 112.4	6.08	16.01	0 3.1 23 56.9
6	4 55 10.42	− 5.599	+19 42 58.3	−45.88	9.740 2936	+ 258.2	6.07	16.00	23 50.8
7	4 52 57.08	5.497	19 25 3.2	43.63	9.741 3555	625.8	6.06	15.96	23 44.7
8	4 50 47.32	5.301	19 8 7.6	40.92	9.743 2922	986.6	6.03	15.89	23 38.7
9	4 48 43.32	5.017	18 52 22.3	37.78	9.746 0831	1337.2	5.99	15.79	23 32.9
10	4 46 47.15	4.651	18 37 57.3	34.24	9.749 7001	1674.5	5.94	15.66	23 27.2
11	4 45 0.71	− 4.208	+18 25 1.4	−30.37	9.754 1082	+1995.9	5.88	15.50	23 21.7
12	4 43 25.74	3.696	18 13 42.1	26.20	9.759 2666	2299.5	5.81	15.32	23 16.4
13	4 42 3.78	3.125	18 4 5.5	21.82	9.765 1301	2583.4	5.74	15.11	23 11.3
14	4 40 56.16	2.502	17 56 16.3	17.26	9.771 6501	2846.4	5.65	14.89	23 6.5
15	4 40 4.03	1.835	17 50 17.7	12.61	9.778 7756	3087.9	5.56	14.65	23 2.0
16	4 39 28.35	− 1.133	+17 46 11.5	− 7.91	9.786 4546	+3307.6	5.46	14.39	22 57.7
17	4 39 9.90	− 0.401	17 43 58.2	− 3.21	9.794 6349	3505.7	5.36	14.12	22 53.8
18	4 39 9.29	+ 0.353	17 43 36.8	+ 1.42	9.803 2651	3682.6	5.25	13.84	22 50.1
19	4 39 26.98	1.123	17 45 5.4	5.94	9.812 2951	3839.0	5.14	13.56	22 46.8
20	4 40 3.31	1.906	17 48 20.8	10.31	9.821 6766	3975.7	5.04	13.27	22 43.7
21	4 40 58.52	+ 2.695	+17 53 19.1	+14.50	9.831 3636	+4093.7	4.92	12.98	22 41.0
22	4 42 12.74	3.490	17 59 55.4	18.48	9.841 3126	4194.2	4.81	12.68	22 38.6
23	4 43 46.05	4.286	18 8 4.5	22.22	9.851 4828	4278.3	4.70	12.39	22 36.5
24	4 45 38.46	5.082	18 17 40.1	25.70	9.861 8361	4347.0	4.59	12.10	22 34.8
25	4 47 49.97	5.877	18 28 35.9	28.90	9.872 3367	4401.2	4.48	11.81	22 33.3
26	4 50 20.52	+ 6.668	+18 40 44.9	+31.80	9.882 9511	+4442.0	4.37	11.52	22 32.2
27	4 53 10.04	7.458	18 53 59.7	34.38	9.893 6482	4470.2	4.27	11.24	22 31.4
28	4 56 18.48	8.245	19 8 12.7	36.65	9.904 3985	4486.5	4.16	10.97	22 30.9
29	4 59 45.77	9.029	19 23 15.9	38.57	9.915 1742	4491.5	4.06	10.70	22 30.7
30	5 3 31.84	9.810	19 39 1.0	40.13	9.925 9488	4485.6	3.96	10.44	22 30.8
1	5 7 36.63	+10.589	+19 55 19.3	+41.33	9.936 6969	+4469.4	3.86	10.18	22 31.2
2	5 12 0.08	+11.365	+20 12 2.0	+42.16	9.947 3936	+4442.9	3.77	9.93	22 32.0

MERCURY, 1916.

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h m
July 1	5 7 36.63	+10.589	+19 55 19.3	+ 41.33	9.936 6969	+4469.4	3.86	10.18	22 31.2
2	5 12 0.08	11.365	20 12 2.0	42.16	9.947 3936	4442.9	3.77	9.93	22 32.0
3	5 16 42.15	12.140	20 28 59.7	42.58	9.958 0145	4406.2	3.68	9.69	22 33.0
4	5 21 42.77	12.911	20 46 2.8	42.60	9.968 5353	4359.5	3.59	9.46	22 34.4
5	5 27 1.87	13.680	21 3 1.4	42.20	9.978 9317	4302.5	3.51	9.24	22 36.1
6	5 32 39.37	+14.444	+21 19 45.0	+ 41.36	9.989 1790	+4235.2	3.42	9.02	22 38.0
7	5 38 35.13	15.202	21 36 2.9	40.06	9.999 2519	4157.1	3.35	8.82	22 40.3
8	5 44 48.99	15.951	21 51 43.9	38.28	0.009 1242	4068.0	3.27	8.62	22 42.9
9	5 51 20.70	16.689	22 6 36.6	36.02	0.018 7692	3967.6	3.20	8.43	22 45.8
10	5 58 9.93	17.411	22 20 29.1	33.27	0.028 1596	3855.8	3.13	8.25	22 48.9
11	6 5 16.27	+18.113	+22 33 9.5	+ 30.01	0.037 2673	+3732.0	3.06	8.08	22 52.4
12	6 12 39.17	18.790	22 44 25.5	26.24	0.046 0636	3596.2	3.00	7.91	22 56.1
13	6 20 17.92	19.434	22 54 5.2	21.99	0.054 5197	3448.5	2.95	7.76	23 0.0
14	6 28 11.68	20.039	23 1 56.9	17.24	0.062 6073	3289.2	2.89	7.62	23 4.2
15	6 36 19.43	20.598	23 7 49.1	12.04	0.070 2988	3118.6	2.84	7.48	23 8.6
16	6 44 39.97	+21.104	+23 11 31.3	+ 6.41	0.077 5683	+2937.7	2.79	7.36	23 13.2
17	6 53 11.93	21.549	23 12 54.0	+ 0.42	0.084 3921	2747.4	2.75	7.25	23 18.0
18	7 1 53.81	21.929	23 11 49.2	− 5.87	0.090 7497	2549.4	2.71	7.14	23 22.9
19	7 10 43.94	22.237	23 8 10.2	12.42	0.096 6242	2345.2	2.67	7.04	23 27.9
20	7 19 40.57	22.470	23 1 52.1	19.11	0.102 0031	2136.8	2.64	6.96	23 33.0
21	7 28 41.88	+22.627	+22 52 52.1	− 25.88	0.106 8788	+1926.1	2.61	6.88	23 38.1
22	7 37 46.06	22.708	22 41 9.4	32.66	0.111 2485	1715.4	2.59	6.81	23 43.3
23	7 46 51.29	22.716	22 26 44.9	39.35	0.115 1143	1506.6	2.56	6.75	23 48.5
24	7 55 55.86	22.654	22 9 41.5	45.88	0.118 4834	1301.8	2.54	6.70	23 53.6
25	8 4 58.16	22.528	21 50 3.9	52.20	0.121 3672	1102.5	2.53	6.65	23 58.6
26	8 13 56.72	+22.343	+21 27 58.1	− 58.24	0.123 7807	+ 910.0	2.51	6.62	. . . . .
27	8 22 50.23	22.108	21 3 31.2	63.95	0.125 7418	725.6	2.50	6.59	0 3.6
28	8 31 37.57	21.830	20 36 51.5	69.31	0.127 2709	550.1	2.49	6.56	0 8.4
29	8 40 17.80	21.517	20 8 7.5	74.29	0.128 3899	384.0	2.48	6.55	0 13.2
30	8 48 50.13	21.174	19 37 28.5	78.89	0.129 1215	227.3	2.48	6.54	0 17.8
31	8 57 13.98	+20.810	+19 5 3.7	− 83.11	0.129 4886	+ 80.2	2.48	6.53	0 22.3
Aug. 1	9 5 28.88	20.430	18 31 2.1	86.95	0.129 5138	− 57.6	2.48	6.53	0 26.6
2	9 13 34.53	20.040	17 55 32.9	90.42	0.129 2193	186.3	2.48	6.53	0 30.7
3	9 21 30.74	19.644	17 18 44.8	93.53	0.128 6262	306.5	2.48	6.54	0 34.7
4	9 29 17.41	19.246	16 40 46.1	96.30	0.127 7542	418.8	2.49	6.56	0 38.6
5	9 36 54.54	+18.849	+16 1 44.8	− 98.75	0.126 6218	− 523.6	2.50	6.57	0 42.3
6	9 44 22.19	18.456	15 21 48.4	100.90	0.125 2465	621.4	2.50	6.59	0 45.8
7	9 51 40.48	18.069	14 41 3.8	102.77	0.123 6440	713.0	2.51	6.62	0 49.1
8	9 58 49.57	17.690	13 59 37.6	104.38	0.121 8283	799.1	2.52	6.65	0 52.4
9	10 5 49.66	17.319	13 17 35.8	105.74	0.119 8122	880.2	2.53	6.68	0 55.4
10	10 12 40.97	+16.958	+12 35 4.1	−106.87	0.117 6072	− 956.7	2.55	6.71	0 58.3
11	10 19 23.74	16.608	11 52 7.8	107.79	0.115 2234	1029.2	2.56	6.75	1 1.1
12	10 25 58.22	16.267	11 8 51.7	108.52	0.112 6699	1098.2	2.58	6.79	1 3.7
13	10 32 24.64	15.937	10 25 20.3	109.07	0.109 9542	1164.4	2.59	6.83	1 6.2
14	10 38 43.27	15.617	9 41 37.9	109.44	0.107 0829	1228.0	2.61	6.88	1 8.6
15	10 44 54.35	+15.308	+ 8 57 48.3	−109.67	0.104 0616	−1289.4	2.63	6.92	1 10.8
16	*10 50 58.11*	*+15.008*	+ 8 13 55.2	−109.74	0.100 8951	−1349.1	2.65	6.98	1 12.9

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h m
Aug. 16	10 50 58.11	+15.008	+ 8 13 55.2	−109.74	0.100 8951	−1349.1	2.65	6.98	1 12.9
17	10 56 54.78	14.717	7 30 2.0	109.67	0.097 5870	1407.5	2.67	7.03	1 14.9
18	11 2 44.57	14.434	6 46 11.9	109.48	0.094 1401	1464.8	2.69	7.08	1 16.8
19	11 8 27.67	14.159	6 2 28.0	109.16	0.090 5565	1521.4	2.71	7.14	1 18.6
20	11 14 4.27	13.892	5 18 53.3	108.72	0.086 8377	1577.5	2.73	7.20	1 20.3
21	11 19 34.54	+13.631	+ 4 35 30.5	−108.17	0.082 9844	−1633.5	2.76	7.27	1 21.8
22	11 24 58.61	13.375	3 52 22.2	107.50	0.078 9967	1689.5	2.78	7.34	1 23.3
23	11 30 16.61	13.125	3 9 31.1	106.73	0.074 8743	1745.8	2.81	7.41	1 24.6
24	11 35 28.64	12.878	2 26 59.8	105.86	0.070 6162	1802.7	2.84	7.48	1 25.9
25	11 40 34.79	12.635	1 44 50.7	104.88	0.066 2210	1860.1	2.87	7.55	1 27.0
26	11 45 35.10	+12.392	+ 1 3 6.3	−103.80	0.061 6870	−1918.4	2.90	7.63	1 28.1
27	11 50 29.61	12.150	+ 0 21 49.1	102.62	0.057 0120	1977.7	2.93	7.72	1 29.0
28	11 55 18.32	11.909	− 0 18 58.4	101.33	0.052 1933	2038.1	2.96	7.80	1 29.9
29	12 0 1.22	11.665	0 59 13.7	99.93	0.047 2280	2099.8	3.00	7.89	1 30.7
30	12 4 38.25	11.420	1 38 54.2	98.43	0.042 1129	2163.0	3.03	7.99	1 31.3
31	12 9 9.32	+11.169	− 2 17 57.2	− 96.81	0.036 8445	−2227.6	3.07	8.08	1 31.9
Sept. 1	12 13 34.31	10.912	2 56 19.9	95.07	0.031 4191	2293.8	3.11	8.18	1 32.4
2	12 17 53.07	10.649	3 33 59.5	93.20	0.025 8330	2361.6	3.15	8.29	1 32.7
3	12 22 5.40	10.377	4 10 52.8	91.21	0.020 0823	2431.0	3.19	8.40	1 33.0
4	12 26 11.07	10.093	4 46 56.6	89.08	0.014 1632	2501.9	3.23	8.52	1 33.1
5	12 30 9.79	+ 9.797	− 5 22 7.5	− 86.80	0.008 0719	−2574.4	3.28	8.64	1 33.2
6	12 34 1.24	9.487	5 56 21.7	84.36	0.001 8049	2648.3	3.33	8.76	1 33.1
7	12 37 45.03	9.160	6 29 35.3	81.75	9.995 3589	2723.5	3.38	8.89	1 32.8
8	12 41 20.74	8.813	7 1 44.0	78.95	9.988 7311	2799.8	3.43	9.03	1 32.5
9	12 44 47.85	8.443	7 32 43.1	75.94	9.981 9194	2876.8	3.48	9.17	1 32.0
10	12 48 5.81	+ 8.049	− 8 2 27.5	− 72.72	9.974 9225	−2954.0	3.54	9.32	1 31.3
11	12 51 13.98	7.627	8 30 51.5	69.25	9.967 7402	3031.2	3.60	9.48	1 30.5
12	12 54 11.67	7.175	8 57 49.2	65.51	9.960 3736	3107.5	3.66	9.64	1 29.5
13	12 56 58.09	6.688	9 23 13.8	61.49	9.952 8258	3182.0	3.72	9.81	1 28.3
14	12 59 32.38	6.163	9 46 58.0	57.14	9.945 1020	3253.9	3.79	9.99	1 26.9
15	13 1 53.59	+ 5.598	−10 8 53.7	− 52.44	9.937 2102	−3321.8	3.86	10.17	1 25.3
16	13 4 0.71	4.988	10 28 51.8	47.34	9.929 1617	3384.2	3.93	10.36	1 23.5
17	13 5 52.61	4.329	10 46 42.6	41.82	9.920 9723	3438.9	4.01	10.56	1 21.4
18	13 7 28.11	3.620	11 2 15.4	35.83	9.912 6631	3483.6	4.08	10.76	1 19.0
19	13 8 45.95	2.858	11 15 18.5	29.34	9.904 2610	3515.7	4.16	10.97	1 16.4
20	13 9 44.84	+ 2.040	−11 25 39.4	− 22.30	9.895 8005	−3531.7	4.24	11.19	1 13.4
21	13 10 23.46	1.168	11 33 4.4	14.68	9.887 3249	3527.6	4.33	11.41	1 10.1
22	13 10 40.50	+ 0.243	11 37 19.4	− 6.46	9.878 8876	3499.0	4.41	11.63	1 6.4
23	13 10 34.73	− 0.732	11 38 9.6	+ 2.39	9.870 5537	3440.5	4.50	11.86	1 2.4
24	13 10 5.02	1.750	11 35 20.2	11.84	9.862 4011	3346.8	4.58	12.08	0 57.9
25	13 9 10.49	− 2.800	−11 28 36.6	+ 21.88	9.854 5224	−3211.3	4.67	12.30	0 53.1
26	13 7 50.53	3.866	11 17 45.7	32.43	9.847 0254	3027.7	4.75	12.52	0 47.8
27	13 6 4.97	4.929	11 2 36.6	43.38	9.840 0331	2789.8	4.83	12.72	0 42.1
28	13 3 54.18	5.964	10 43 1.6	54.56	9.833 6826	2492.0	4.90	12.91	0 36.0
29	13 1 19.19	6.940	10 18 58.3	65.70	9.828 1231	2129.9	4.96	13.07	0 29.5
30	12 58 21.84	− 7.820	− 9 50 30.8	+ 76.51	9.823 5125	−1701.0	5.01	13.21	0 22.6
Oct. 1	12 55 4.85	− 8.570	− 9 17 51.3	+ 86.62	9.820 0117	−1205.5	5.05	13.32	0 15.5

GREENWICH MEAN TIME.

Date.		Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
		Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
		h m s	s	° ′ ″	″			″	″	h m
Oct.	1	12 55 4.85	− 8.570	− 9 17 51.3	+ 86.62	9.820 0117	−1205.5	5.05	13.32	0 15.5
	2	12 51 31.84	9.148	8 41 22.0	95.60	9.817 7762	647.6	5.08	13.39	0 8.0
	3	12 47 47.38	9.518	8 1 35.3	103.00	9.816 9465	− 35.7	5.09	13.41	0 0.4 23 52.6
	4	12 43 56.84	9.650	7 19 14.1	108.40	9.817 6382	+ 617.9	5.08	13.39	23 44.9
	5	12 40 6.25	9.520	6 35 11.1	111.43	9.819 9328	1297.0	5.06	13.32	23 37.2
	6	12 36 22.02	− 9.119	− 5 50 26.4	+111.83	9.823 8686	+1982.2	5.01	13.20	23 29.8
	7	12 32 50.67	8.450	5 6 5.0	109.48	9.829 4352	2652.4	4.95	13.03	23 22.7
	8	12 29 38.45	7.528	4 23 12.9	104.41	9.836 5718	3287.2	4.87	12.82	23 16.0
	9	12 26 51.08	6.385	3 42 53.5	96.80	9.845 1706	3868.0	4.77	12.57	23 9.8
	10	12 24 33.42	5.059	3 6 3.9	86.98	9.855 0826	4379.4	4.66	12.29	23 4.1
	11	12 22 49.33	− 3.595	− 2 33 32.6	+ 75.36	9.866 1274	+4810.5	4.55	11.98	22 59.0
	12	12 21 41.56	2.041	2 5 57.3	62.39	9.878 1040	5155.2	4.42	11.65	22 54.5
	13	12 21 11.68	− 0.445	1 43 44.7	48.55	9.890 8020	5411.8	4.29	11.32	22 50.7
	14	12 21 20.20	+ 1.151	1 27 10.1	34.30	9.904 0120	5582.7	4.17	10.98	22 47.5
	15	12 22 6.66	2.711	1 16 18.7	20.01	9.917 5346	5673.4	4.04	10.64	22 45.0
	16	12 23 29.78	+ 4.202	− 1 11 6.8	+ 6.05	9.931 1864	+5691.8	3.91	10.31	22 43.0
	17	12 25 27.63	5.602	1 11 23.2	− 7.30	9.944 8046	5647.0	3.79	9.99	22 41.5
	18	12 27 57.83	6.896	1 16 50.9	19.85	9.958 2497	5549.1	3.68	9.69	22 40.5
	19	12 30 57.70	8.073	1 27 9.0	31.48	9.971 4059	5407.9	3.57	9.40	22 40.0
	20	12 34 24.39	9.131	1 41 53.6	42.07	9.984 1807	5232.8	3.46	9.13	22 39.9
	21	12 38 15.04	+10.070	− 2 0 39.6	− 51.59	9.996 5033	+5032.5	3.37	8.87	22 40.3
	22	12 42 26.86	10.895	2 23 1.2	60.04	0.008 3225	4814.4	3.28	8.63	22 40.7
	23	12 46 57.17	11.613	2 48 33.0	67.44	0.019 6040	4585.4	3.19	8.41	22 41.5
	24	12 51 43.52	12.233	3 16 50.3	73.85	0.030 3279	4350.7	3.11	8.21	22 42.5
	25	12 56 43.66	12.764	3 47 29.9	79.31	0.040 4865	4114.9	3.04	8.02	22 43.8
	26	13 1 55.57	+13.216	− 4 20 10.1	− 83.91	0.050 0813	+3881.4	2.98	7.84	22 45.2
	27	13 7 17.46	13.598	4 54 31.1	87.72	0.059 1210	3652.7	2.91	7.68	22 46.8
	28	13 12 47.80	13.921	5 30 14.8	90.82	0.067 6197	3430.8	2.86	7.53	22 48.5
	29	13 18 25.25	14.192	6 7 4.8	93.26	0.075 5955	3217.2	2.81	7.39	22 50.2
	30	13 24 8.66	14.419	6 44 46.5	95.13	0.083 0692	3012.5	2.76	7.27	22 52.1
	31	13 29 57.08	+14.610	− 7 23 7.0	− 96.50	0.090 0627	+2817.1	2.71	7.15	22 54.0
Nov.	1	13 35 49.69	14.770	8 1 54.6	97.40	0.096 5988	2631.3	2.67	7.05	22 56.0
	2	13 41 45.84	14.905	8 40 59.2	97.92	0.102 7005	2455.0	2.64	6.95	22 58.1
	3	13 47 44.97	15.020	9 20 11.8	98.08	0.108 3903	2288.0	2.60	6.86	23 0.1
	4	13 53 46.65	15.118	9 59 24.5	97.93	0.113 6899	2129.8	2.57	6.77	23 2.3
	5	13 59 50.51	+15.203	−10 38 30.2	− 97.51	0.118 6201	+1980.1	2.54	6.70	23 4.4
	6	14 5 56.28	15.277	11 17 22.9	96.85	0.123 2006	1838.3	2.51	6.63	23 6.6
	7	14 12 3.75	15.344	11 55 57.1	95.98	0.127 4500	1704.0	2.49	6.56	23 8.8
	8	14 18 12.75	15.405	12 34 8.0	94.91	0.131 3855	1576.7	2.47	6.50	23 11.1
	9	14 24 23.17	15.462	13 11 51.4	93.68	0.135 0232	1455.8	2.45	6.45	23 13.3
	10	14 30 34.91	+15.516	−13 49 3.4	− 92.30	0.138 3779	+1340.8	2.43	6.40	23 15.6
	11	14 36 47.94	15.569	14 25 40.7	90.78	0.141 4633	1231.2	2.41	6.35	23 17.9
	12	14 43 2.22	15.621	15 1 40.1	89.15	0.144 2919	1126.7	2.40	6.31	23 20.2
	13	14 49 17.74	15.673	15 36 58.9	87.40	0.146 8752	1026.7	2.38	6.27	23 22.6
	14	14 55 34.52	15.726	16 11 34.7	85.56	0.149 2235	930.8	2.37	6.24	23 24.9
	15	15 1 52.57	+15.779	−16 45 25.0	− 83.62	0.151 3461	+ 838.6	2.36	6.21	23 27.3
	16	15 8 11.92	+15.834	−17 18 27.7	− 81.59	0.153 2517	+ 749.9	2.35	6.18	23 29.7

MERCURY, 1916.

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″			″	″	h m
ov. 16	15 8 11.92	+15.834	−17 18 27.7	−81.59	0.153 2517	+ 749.9	2.35	6.18	23 29.7
17	15 14 32.61	15.891	17 50 40.8	79.49	0.154 9480	664.1	2.34	6.16	23 32.1
18	15 20 54.68	15.949	18 22 2.5	77.31	0.156 4417	581.0	2.33	6.14	23 34.6
19	15 27 18.17	16.009	18 52 30.9	75.05	0.157 7388	500.3	2.32	6.12	23 37.1
20	15 33 43.12	16.071	19 22 4.4	72.72	0.158 8448	421.7	2.32	6.10	23 39.6
21	15 40 9.58	+16.135	−19 50 41.3	−70.34	0.159 7643	+ 344.9	2.31	6.09	23 42.1
22	15 46 37.58	16.200	20 18 20.2	67.90	0.160 5014	269.6	2.31	6.08	23 44.7
23	15 53 7.17	16.266	20 44 59.4	65.37	0.161 0593	195.5	2.30	6.07	23 47.2
24	15 59 38.37	16.334	21 10 37.5	62.79	0.161 4407	122.5	2.30	6.07	23 49.8
25	16 6 11.21	16.403	21 35 13.0	60.15	0.161 6480	+ 50.3	2.30	6.06	23 52.5
26	16 12 45.71	+16.473	−21 58 44.4	−57.45	0.161 6828	− 21.2	2.30	6.06	23 55.2
27	16 19 21.88	16.542	22 21 10.3	54.70	0.161 5462	92.5	2.30	6.07	23 57.8
28	16 25 59.73	16.612	22 42 29.3	51.87	0.161 2389	163.6	2.30	6.07	. . . . .
29	16 32 39.25	16.681	23 2 39.9	49.00	0.160 7610	234.7	2.31	6.08	0 0.6
30	16 39 20.43	16.750	23 21 40.9	46.07	0.160 1120	306.2	2.31	6.09	0 3.3
ec. 1	16 46 3.24	+16.818	−23 39 30.7	−43.08	0.159 2910	− 378.1	2.31	6.10	0 6.1
2	16 52 47.66	16.884	23 56 8.0	40.02	0.158 2966	450.7	2.32	6.11	0 8.9
3	16 59 33.63	16.947	24 11 31.3	36.91	0.157 1268	524.3	2.33	6.13	0 11.7
4	17 6 21.10	17.008	24 25 39.3	33.74	0.155 7791	599.0	2.33	6.15	0 14.6
5	17 13 10.00	17.066	24 38 30.6	30.52	0.154 2503	675.2	2.34	6.17	0 17.5
6	17 20 0.24	+17.120	−24 50 3.8	−27.26	0.152 5368	− 753.0	2.35	6.19	0 20.4
7	17 26 51.72	17.169	25 0 17.5	23.90	0.150 6342	832.8	2.36	6.22	0 23.3
8	17 33 44.31	17.212	25 9 10.4	20.50	0.148 5375	914.8	2.37	6.25	0 26.2
9	17 40 37.87	17.250	25 16 41.1	17.05	0.146 2412	999.3	2.38	6.28	0 29.2
10	17 47 32.25	17.280	25 22 48.3	13.54	0.143 7389	1086.5	2.40	6.32	0 32.1
11	17 54 27.26	+17.302	−25 27 30.8	− 9.99	0.141 0234	−1176.9	2.41	6.36	0 35.1
12	18 1 22.68	17.315	25 30 47.4	6.39	0.138 0869	1270.8	2.43	6.40	0 38.1
13	18 8 18.28	17.317	25 32 36.9	− 2.73	0.134 9207	1368.4	2.45	6.45	0 41.1
14	18 15 13.79	17.307	25 32 58.2	+ 0.96	0.131 5154	1470.1	2.47	6.50	0 44.1
15	18 22 8.90	17.283	25 31 50.5	4.69	0.127 8606	1576.4	2.49	6.56	0 47.1
16	18 29 3.27	+17.245	−25 29 12.8	+ 8.45	0.123 9449	−1687.6	2.51	6.61	0 50.0
17	18 35 56.52	17.190	25 25 4.5	12.24	0.119 7560	1804.1	2.53	6.68	0 53.0
18	18 42 48.20	17.114	25 19 25.1	16.05	0.115 2805	1926.5	2.56	6.75	0 55.9
19	18 49 37.84	17.018	25 12 14.3	19.85	0.110 5041	2055.0	2.59	6.82	0 58.8
20	18 56 24.88	16.897	25 3 32.1	23.66	0.105 4114	2190.1	2.62	6.90	1 1.6
21	19 3 8.69	+16.749	−24 53 18.7	+27.45	0.099 9860	−2332.3	2.65	6.99	1 4.4
22	19 9 48.59	16.570	24 41 34.7	31.20	0.094 2103	2482.0	2.69	7.08	1 7.2
23	19 16 23.77	16.356	24 28 21.3	34.90	0.088 0660	2639.6	2.73	7.18	1 9.8
24	19 22 53.35	16.102	24 13 40.0	38.52	0.081 5339	2805.2	2.77	7.29	1 12.3
25	19 29 16.31	15.803	23 57 33.0	42.04	0.074 5942	2979.2	2.81	7.41	1 14.8
26	19 35 31.51	+15.454	−23 40 3.2	+45.42	0.067 2269	−3161.6	2.86	7.54	1 17.1
27	19 41 37.66	15.048	23 21 14.3	48.63	0.059 4119	3352.2	2.91	7.67	1 19.2
28	19 47 33.29	14.578	23 1 11.0	51.62	0.051 1300	3550.6	2.97	7.82	1 21.2
29	19 53 16.78	14.034	22 39 59.0	54.34	0.042 3632	3756.1	3.03	7.98	1 23.0
30	19 58 46.25	13.408	22 17 45.3	56.74	0.033 0959	3967.5	3.09	8.15	1 24.5
31	20 3 59.65	+12.692	−21 54 38.4	+58.76	0.023 3160	−4183.0	3.16	8.34	1 25.8
32	20 8 54.66	+11.878	−21 30 48.2	+60.35	0.013 0168	−4399.8	3.24	8.54	1 26.7

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″		
Jan.	1	312 38 27.7	3 27 27.6	+ 2 5.5	−6 58 47.7	− 2 3.3	9.621 3339	−50325
	2	316 8 23.7	3 32 28.0	+ 0 32.3	7 0 6.0	− 0 32.2	9.616 1735	52875
	3	319 43 30.7	3 37 49.5	− 1 4.1	6 59 49.7	+ 1 6.0	9.610 7615	55352
	4	323 24 9.9	3 43 32.6	2 41.7	6 57 51.6	2 51.6	9.605 1061	57739
	5	327 10 43.1	3 49 37.5	4 19.2	6 54 3.9	4 45.1	9.599 2177	60008
	6	331 3 32.4	3 56 4.8	− 5 54.9	−6 48 18.6	+ 6 47.0	9.593 1093	−62133
	7	335 3 0.3	4 2 54.8	7 26.4	6 40 27.1	8 57.4	9.586 7971	64078
	8	339 9 29.4	4 10 7.1	8 51.6	6 30 20.9	11 16.5	9.580 3014	65796
	9	343 23 21.9	4 17 41.5	10 8.1	6 17 51.3	13 44.2	9.573 6469	67245
	10	347 44 59.5	4 25 37.2	11 13.1	6 2 49.8	16 20.1	9.566 8632	68372
	11	352 14 42.8	4 33 52.6	−12 3.9	−5 45 8.6	+19 3.6	9.559 9853	−69118
	12	356 52 50.5	4 42 25.6	12 37.8	5 24 40.5	21 53.6	9.553 0547	69414
	13	1 39 39.1	4 51 14.0	12 52.0	5 1 19.9	24 48.3	9.546 1197	69194
	14	6 35 22.2	5 0 13.8	12 44.2	4 35 3.0	27 45.7	9.539 2354	68387
	15	11 40 8.7	5 9 20.3	12 12.6	4 5 48.6	30 42.8	9.532 4643	66918
	16	16 54 3.0	5 18 28.0	−11 15.9	−3 33 38.7	+33 36.0	9.525 8762	−64717
	17	22 17 2.8	5 27 30.2	9 53.9	2 58 39.4	36 20.9	9.519 5473	61722
	18	27 48 59.0	5 36 19.1	8 7.8	2 21 1.4	38 52.5	9.513 5600	57882
	19	33 29 33.4	5 44 45.4	6 0.0	1 41 0.8	41 5.1	9.508 0001	53169
	20	39 18 19.0	5 52 39.5	3 34.4	0 58 59.5	42 52.9	9.502 9557	47575
	21	45 14 38.2	5 59 50.8	− 0 56.6	−0 15 25.1	+44 10.3	9.498 5135	−41131
	22	51 17 42.9	6 6 8.9	+ 1 46.8	+0 29 9.3	44 52.0	9.494 7559	33897
	23	57 26 34.7	6 11 23.2	4 27.8	1 14 5.6	44 53.6	9.491 7571	25974
	24	63 40 4.8	6 15 24.1	6 58.1	1 58 42.1	44 12.0	9.489 5797	17496
	25	69 56 55.8	6 18 3.7	9 9.7	2 42 15.0	42 46.5	9.488 2709	− 8632
	26	76 15 43.2	6 19 16.2	+10 55.2	+3 24 0.8	+40 38.1	9.487 8598	+ 425
	27	82 34 58.0	6 18 58.2	12 8.9	4 3 17.8	37 49.7	9.488 3555	9470
	28	88 53 9.2	6 17 9.2	12 47.1	4 39 28.6	34 26.7	9.489 7469	18305
	29	95 8 46.9	6 13 51.9	12 48.3	5 12 1.7	30 35.4	9.492 0032	26738
	30	101 20 25.3	6 9 11.7	12 13.6	5 40 32.6	26 23.6	9.495 0756	34603
	31	107 26 45.2	6 3 16.5	+11 6.1	+6 4 44.8	+21 59.4	9.498 9004	+41767
Feb.	1	113 26 36.5	5 56 16.1	9 30.6	6 24 29.7	17 30.3	9.503 4024	48135
	2	119 18 59.4	5 48 21.6	7 33.0	6 39 46.2	13 3.6	9.508 4988	53645
	3	125 3 5.4	5 39 44.3	5 20.0	6 50 39.7	8 45.2	9.514 1021	58277
	4	130 38 17.7	5 30 36.2	2 58.3	6 57 21.0	4 40.0	9.520 1249	62033
	5	136 4 10.9	5 21 7.7	+ 0 34.0	+7 0 5.3	+ 0 51.6	9.526 4812	+64954
	6	141 20 29.6	5 11 28.9	− 1 47.2	6 59 10.5	− 2 37.9	9.533 0896	67086
	7	146 27 8.2	5 1 48.6	4 0.7	6 54 56.2	5 47.3	9.539 8742	68489
	8	151 24 8.8	4 52 14.1	6 2.9	6 47 42.7	8 36.2	9.546 7658	69239
	9	156 11 40.2	4 42 51.3	7 51.0	6 37 50.6	11 4.8	9.553 7027	69407
	10	160 49 56.9	4 33 45.1	− 9 23.3	+6 25 39.5	−13 14.3	9.560 6303	+69065
	11	165 19 17.1	4 24 59.0	10 38.7	6 11 28.0	15 5.8	9.567 5010	68282
	12	169 40 2.4	4 16 35.7	11 36.9	5 55 33.4	16 40.7	9.574 2740	67121
	13	173 52 36.5	4 8 36.7	12 18.1	5 38 11.7	18 0.4	9.580 9147	65644
	14	177 57 24.2	4 1 3.1	12 42.9	5 19 37.1	19 6.7	9.587 3940	63903
	15	181 54 51.4	3 53 55.5	−12 52.2	+5 0 2.3	−20 0.9	9.593 6879	+61942
	16	185 45 23.9	3 47 13.7	−12 47.2	+4 39 38.8	−20 44.4	9.599 7764	+59803

FOR GREENWICH MEAN NOON.

ate.	Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″		
16	185 45 23.9	3 47 13.7	−12 47.2	+4 39 38.8	−20 44.4	9.599 7764	+59803
17	189 29 27.4	3 40 57.6	12 29.1	4 18 36.5	21 18.7	9.605 6436	57520
18	193 7 27.4	3 35 6.4	11 59.2	3 57 4.1	21 44.8	9.611 2767	55124
19	196 39 48.3	3 29 39.4	11 19.0	3 35 9.2	22 3.9	9.616 6654	52638
20	200 6 54.1	3 24 36.0	10 29.6	3 12 58.4	22 16.8	9.621 8019	50084
21	203 29 7.8	3 19 55.0	− 9 32.7	+2 50 37.4	−22 24.3	9.626 6806	+47482
22	206 46 51.3	3 15 35.6	8 29.3	2 28 11.3	22 27.2	9.631 2971	44841
23	210 0 25.9	3 11 36.8	7 20.6	2 5 44.2	22 26.4	9.635 6482	42176
24	213 10 11.5	3 7 57.6	6 7.8	1 43 19.7	22 22.0	9.639 7320	39497
25	216 16 27.5	3 4 37.4	4 51.9	1 21 1.1	22 14.7	9.643 5475	36811
26	219 19 32.3	3 1 35.1	− 3 34.0	+0 58 51.1	−22 4.9	9.647 0943	+34124
27	222 19 43.4	2 58 50.0	2 14.8	0 36 52.1	21 52.8	9.650 3724	31439
28	225 17 17.7	2 56 21.3	− 0 55.4	+0 15 6.1	21 38.9	9.653 3823	28759
29	228 12 31.2	2 54 8.3	+ 0 23.6	−0 6 25.2	21 23.4	9.656 1244	26085
1	231 5 39.3	2 52 10.5	1 41.3	0 27 40.1	21 6.2	9.658 5998	23424
2	233 56 57.0	2 50 27.3	+ 2 57.3	−0 48 37.1	−20 47.7	9.660 8095	+20771
3	236 46 38.6	2 48 58.2	4 10.8	1 9 15.1	20 28.0	9.662 7544	18128
4	239 34 57.9	2 47 42.7	5 21.2	1 29 32.8	20 7.2	9.664 4355	15494
5	242 22 8.4	2 46 40.5	6 28.1	1 49 29.1	19 45.2	9.665 8538	12872
6	245 8 23.3	2 45 51.4	7 31.0	2 9 2.9	19 22.2	9.667 0101	10256
7	247 53 55.5	2 45 15.0	+ 8 29.3	−2 28 13.2	−18 58.2	9.667 9051	+ 7645
8	250 38 57.4	2 44 50.9	9 22.8	2 46 59.0	18 33.2	9.668 5393	5039
9	253 23 41.5	2 44 39.3	10 10.9	3 5 19.2	18 7.1	9.668 9132	+ 2439
10	256 8 20.1	2 44 40.0	10 53.4	3 23 12.8	17 39.9	9.669 0271	− 161
11	258 53 5.5	2 44 52.9	11 29.9	3 40 38.5	17 11.4	9.668 8810	2762
12	261 38 9.9	2 45 17.9	+12 0.0	−3 57 35.1	−16 41.6	9.668 4748	− 5362
13	264 23 45.4	2 45 55.1	12 23.6	4 14 1.3	16 10.5	9.667 8083	7967
14	267 10 4.3	2 46 44.8	12 40.3	4 29 55.7	15 38.0	9.666 8811	10578
15	269 57 19.2	2 47 47.0	12 49.9	4 45 16.8	15 3.8	9.665 6925	13196
16	272 45 42.6	2 49 1.9	12 52.2	5 0 2.7	14 27.7	9.664 2417	15822
17	275 35 27.4	2 50 29.8	+12 47.0	−5 14 11.6	−13 49.8	9.662 5279	−18456
18	278 26 46.7	2 52 11.0	12 34.3	5 27 41.5	13 9.6	9.660 5502	21099
19	281 19 54.0	2 54 5.9	12 13.7	5 40 29.9	12 26.9	9.658 3077	23753
20	284 15 3.1	2 56 14.7	11 45.4	5 52 34.5	11 41.7	9.655 7993	26416
21	287 12 28.3	2 58 38.1	11 9.4	6 3 52.4	10 53.5	9.653 0240	29090
22	290 12 24.3	3 1 16.5	+10 25.6	−6 14 20.5	−10 2.1	9.649 9810	−31771
23	293 15 6.5	3 4 10.5	9 34.1	6 23 55.4	9 7.1	9.646 6696	34458
24	296 20 50.6	3 7 20.5	8 35.2	6 32 33.4	8 8.2	9.643 0894	37147
25	299 29 53.2	3 10 47.4	7 29.1	6 40 10.4	7 5.0	9.639 2404	39832
26	302 42 31.3	3 14 31.7	6 16.2	6 46 41.8	5 57.0	9.635 1233	42507
27	305 59 2.7	3 18 34.2	+ 4 57.1	−6 52 2.8	− 4 44.0	9.630 7393	−45170
28	309 19 46.0	3 22 55.5	3 32.3	6 56 8.0	3 25.4	9.626 0902	47807
29	312 45 0.3	3 27 36.5	2 2.7	6 58 51.5	2 0.6	9.621 1793	50404
30	316 15 5.7	3 32 37.7	+ 0 29.2	7 0 7.0	− 0 29.3	9.616 0111	52950
31	319 50 22.6	3 37 59.7	− 1 7.1	6 59 47.7	+ 1 9.1	9.610 5917	55425
1	323 31 12.3	3 43 43.3	− 2 44.7	−6 57 46.3	+ 2 55.0	9.604 9290	−57811
2	327 17 56.6	3 49 49.0	− 4 22.2	−6 53 55.1	+ 4 48.8	9.599 0336	−60076

FOR GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″		
Apr. 1	323 31 12.3	3 43 43.3	− 2 44.7	−6 57 46.3	+ 2 55.0	9.604 9290	−57811
2	327 17 56.6	3 49 49.0	4 22.2	6 53 55.1	4 48.8	9.599 0336	60076
3	331 10 57.8	3 56 17.1	5 57.7	6 48 6.0	6 50.9	9.592 9188	62194
4	335 10 38.3	4 3 7.7	7 29.1	6 40 10.5	9 1.5	9.586 6009	64131
5	339 17 20.6	4 10 20.7	8 54.1	6 30 0.1	11 20.9	9.580 1001	65845
6	343 31 27.1	4 17 55.8	−10 10.3	−6 17 26.0	+13 48.8	9.573 4412	−67284
7	347 53 19.2	4 25 52.0	11 14.9	6 2 19.7	16 25.0	9.566 6540	68401
8	352 23 17.6	4 34 8.0	12 5.3	5 44 33.4	19 8.8	9.559 7738	69133
9	357 1 41.0	4 42 41.7	12 38.6	5 24 0.1	21 58.8	9.552 8423	69417
10	1 48 45.9	4 51 30.3	12 52.1	5 0 34.2	24 53.7	9.545 9079	69179
11	6 44 45.4	5 0 30.3	−12 43.6	−4 34 11.8	+27 51.3	9.539 0261	−68352
12	11 49 48.7	5 9 37.0	12 11.2	4 4 51.9	30 48.3	9.532 2596	66862
13	17 3 59.7	5 18 44.6	11 13.7	3 32 36.8	33 41.2	9.525 6782	64638
14	22 27 16.2	5 27 46.6	9 51.0	2 57 32.4	36 25.8	9.519 3586	61617
15	27 59 28.4	5 36 34.8	8 4.2	2 19 49.8	38 56.8	9.513 3831	57750
16	33 40 18.3	5 45 0.4	− 5 55.8	−1 39 45.2	+41 8.8	9.507 8378	−53009
17	39 29 18.3	5 52 53.3	3 29.8	0 57 40.6	42 55.8	9.502 8106	47390
18	45 25 50.6	6 0 3.3	− 0 51.6	−0 14 3.8	44 12.2	9.498 3881	40921
19	51 29 7.0	6 6 19.5	+ 1 51.8	+0 30 31.9	44 52.7	9.494 6526	33664
20	57 38 8.3	6 11 31.6	4 32.6	1 15 28.2	44 52.9	9.491 6782	25720
21	63 51 45.7	6 15 30.2	+ 7 2.5	+2 0 3.3	+44 10.1	9.489 5268	−17230
22	70 8 41.5	6 18 7.3	9 13.3	2 43 33.6	42 43.2	9.488 2450	− 8358
23	76 27 31.1	6 19 17.0	10 57.9	3 25 15.4	40 33.4	9.487 8615	+ 703
24	82 46 45.3	6 18 56.1	12 10.6	4 4 27.3	37 44.1	9.488 3850	9746
25	89 4 53.0	6 17 4.4	12 47.6	4 40 31.9	34 19.9	9.489 8035	18571
26	95 20 24.7	6 13 44.6	+12 47.8	+5 12 57.8	+30 27.9	9.492 0856	+26988
27	101 31 54.5	6 9 1.9	12 12.0	5 41 21.0	26 15.7	9.495 1821	34834
28	107 38 3.5	6 3 4.5	11 3.6	6 5 25.1	21 51.2	9.499 0289	41974
29	113 37 41.9	5 56 2.3	9 27.3	6 25 1.8	17 22.1	9.503 5503	48315
30	119 29 50.2	5 48 6.3	7 29.1	6 40 10.1	12 55.6	9.508 6633	53799
May 1	125 13 40.4	5 39 28.0	+ 5 15.8	+6 50 55.7	+ 8 37.5	9.514 2807	+58405
2	130 48 36.0	5 30 19.0	2 53.9	6 57 29.5	4 32.8	9.520 3148	62138
3	136 14 11.7	5 20 50.0	+ 0 29.6	7 0 6.8	+ 0 44.9	9.526 6800	65031
4	141 30 12.7	5 11 11.2	− 1 51.5	6 59 5.6	− 2 44.0	9.533 2949	67140
5	146 36 33.5	5 1 30.9	4 4.7	6 54 45.4	5 52.8	9.540 0838	68523
6	151 33 16.5	4 51 56.7	− 6 6.5	+6 47 26.8	− 8 41.0	9.546 9777	+69253
7	156 20 30.8	4 42 34.4	7 54.1	6 37 30.1	11 9.0	9.553 9150	69404
8	160 58 30.7	4 33 28.7	9 25.9	6 25 15.0	13 18.0	9.560 8414	69046
9	165 27 34.9	4 24 43.3	10 40.7	6 11 0.1	15 9.0	9.567 7096	68251
10	169 48 4.8	4 16 20.6	11 38.4	5 55 2.7	16 43.3	9.574 4791	67082
11	174 0 24.3	4 8 22.5	−12 19.1	+5 37 38.5	−18 2.6	9.581 1153	+65595
12	178 4 58.2	4 0 49.7	12 43.4	5 19 1.9	19 8.5	9.587 5893	63845
13	182 2 12.3	3 53 42.8	12 52.2	4 59 25.5	20 2.4	9.593 8771	61879
14	185 52 32.5	3 47 1.9	12 46.8	4 39 0.6	20 45.7	9.599 9591	59736
15	189 36 24.6	3 40 46.5	12 28.2	4 17 57.2	21 19.6	9.605 8194	57450
16	193 14 13.8	3 34 56.1	−11 58.1	+3 56 24.0	−21 45.5	9.611 4451	+55049
17	196 46 24.8	3 29 29.8	−11 17.6	+3 34 28.5	−22 4.4	9.616 8262	+52560

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″		
ay	17	196 46 24.8	3 29 29.8	−11 17.6	+3 34 28.5	−22 4.4	9.616 8262	+52560
	18	200 13 21.3	3 24 27.1	10 28.0	3 12 17.3	22 17.0	9.621 9550	50006
	19	203 35 26.5	3 19 46.8	9 30.8	2 49 56.2	22 24.5	9.626 8257	47401
	20	206 53 2.1	3 15 28.0	8 27.2	2 27 29.9	22 27.4	9.631 4340	44760
	21	210 6 29.4	3 11 29.8	7 18.4	2 5 2.8	22 26.2	9.635 7770	42096
	22	213 16 8.3	3 7 51.3	− 6 5.5	+1 42 38.5	−22 21.8	9.639 8528	+39417
	23	216 22 18.2	3 4 31.6	4 49.5	1 20 20.1	22 14.5	9.643 6603	36731
	24	219 25 17.4	3 1 29.8	3 31.5	0 58 10.4	22 4.6	9.647 1990	34044
	25	222 25 23.5	2 58 45.2	2 12.4	0 36 11.7	21 52.5	9.650 4690	31357
	26	225 22 53.2	2 56 16.9	− 0 53.0	+0 14 26.1	21 38.5	9.653 4708	28678
	27	228 18 2.6	2 54 4.4	+ 0 26.0	−0 7 4.7	−21 22.7	9.656 2050	+26007
	28	231 11 7.1	2 52 7.1	1 43.7	0 28 19.0	21 5.6	9.658 6724	23344
	29	234 2 21.6	2 50 24.3	2 59.6	0 49 15.5	20 47.2	9.660 8741	20691
	30	236 52 0.4	2 48 55.6	4 13.0	1 9 52.9	20 27.4	9.662 8110	18048
	31	239 40 17.4	2 47 40.6	5 23.3	1 30 9.9	20 6.5	9.664 4842	15416
ne	1	242 27 26.0	2 46 38.8	+ 6 30.1	−1 50 5.5	−19 44.5	9.665 8946	+12793
	2	245 13 39.4	2 45 50.0	7 32.9	2 9 38.6	19 21.5	9.667 0431	10178
	3	247 59 10.3	2 45 13.9	8 31.1	2 28 48.2	18 57.5	9.667 9303	7567
	4	250 44 11.4	2 44 50.3	9 24.4	2 47 33.2	18 32.4	9.668 5568	4962
	5	253 28 55.1	2 44 39.1	10 12.3	3 5 52.6	18 6.2	9.668 9230	+ 2362
	6	256 13 33.7	2 44 40.1	+10 54.6	−3 23 45.3	−17 39.0	9.669 0292	− 238
	7	258 58 19.3	2 44 53.3	11 30.9	3 41 10.1	17 10.5	9.668 8754	2838
	8	261 43 24.3	2 45 18.6	12 0.9	3 58 5.8	16 40.7	9.668 4615	5441
	9	264 29 0.8	2 45 56.3	12 24.2	4 14 31.1	16 9.6	9.667 7873	8045
	10	267 15 21.1	2 46 46.4	12 40.7	4 30 24.5	15 36.9	9.666 8523	10655
	11	270 2 37.7	2 47 48.9	+12 50.1	−4 45 44.4	−15 2.6	9.665 6559	−13274
	12	272 51 3.2	2 49 4.2	12 52.1	5 0 29.2	14 26.6	9.664 1973	15900
	13	275 40 50.4	2 50 32.5	12 46.7	5 14 37.0	13 48.6	9.662 4757	18534
	14	278 32 12.6	2 52 14.1	12 33.7	5 28 5.6	13 8.2	9.660 4902	21178
	15	281 25 23.2	2 54 9.3	12 13.0	5 40 52.7	12 25.6	9.658 2398	23832
	16	284 20 35.9	2 56 18.6	+11 44.4	−5 52 55.9	−11 40.3	9.655 7235	−26495
	17	287 18 5.2	2 58 42.4	11 8.1	6 4 12.3	10 52.0	9.652 9403	29170
	18	290 18 5.8	3 1 21.3	10 24.1	6 14 38.8	10 0.4	9.649 8893	31851
	19	293 20 53.0	3 4 15.7	9 32.3	6 24 12.0	9 5.4	9.646 5699	34538
	20	296 26 42.6	3 7 26.2	8 33.3	6 32 48.2	8 6.3	9.642 9817	37227
	21	299 35 51.1	3 10 53.6	+ 7 27.0	−6 40 23.2	− 7 3.0	9.639 1247	−39912
	22	302 48 35.7	3 14 38.5	6 13.9	6 46 52.6	5 55.0	9.634 9996	42588
	23	306 5 14.2	3 18 41.6	4 54.6	6 52 11.4	4 41.7	9.630 6076	45249
	24	309 26 5.2	3 23 3.4	3 29.7	6 56 14.2	3 22.9	9.625 9506	47884
	25	312 51 27.6	3 27 44.8	1 59.9	6 58 55.1	1 57.9	9.621 0318	50482
	26	316 21 41.7	3 32 46.8	+ 0 26.3	−7 0 7.8	− 0 26.4	9.615 8559	−53026
	27	319 57 8.0	3 38 9.4	− 1 10.0	6 59 45.5	+ 1 12.1	9.610 4290	55499
	28	323 38 7.8	3 43 53.8	2 47.7	6 57 41.0	2 58.2	9.604 7591	57882
	29	327 25 2.9	3 50 0.1	4 25.1	6 53 46.4	4 52.3	9.598 8567	60145
	30	331 18 15.4	3 56 28.8	6 0.5	6 47 53.6	6 54.7	9.592 7352	62258
ly	1	335 18 8.0	4 3 20.1	− 7 31.7	−6 39 54.2	+ 9 5.6	9.586 4112	−64189
	2	339 25 3.1	4 10 33.8	− 8 56.5	−6 29 39.5	+11 25.2	9.579 9050	−65894

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″		
July	1	335 18 8.0	4 3 20.1	− 7 31.7	−6 39 54.2	+ 9 5.6	9.586 4112	−64189
	2	339 25 3.1	4 10 33.8	8 56.5	6 29 39.5	11 25.2	9.579 9050	65894
	3	343 39 23.0	4 18 9.6	10 12.4	6 17 0.9	13 53.4	9.573 2415	67327
	4	348 1 29.2	4 26 6.3	11 16.7	6 1 50.0	16 29.8	9.566 4506	68432
	5	352 31 42.2	4 34 22.9	12 6.5	5 43 58.8	19 13.8	9.559 5680	69151
	6	357 10 20.9	4 42 57.2	−12 39.2	−5 23 20.4	+22 4.0	9.552 6354	−69421
	7	1 57 41.5	4 51 46.3	12 52.2	4 59 49.2	24 59.0	9.545 7012	69170
	8	6 53 57.1	5 0 46.5	12 42.9	4 33 21.6	27 56.5	9.538 8212	68325
	9	11 59 16.7	5 9 53.4	12 9.8	4 3 56.4	30 53.5	9.532 0585	66811
	10	17 13 44.2	5 19 1.2	11 11.6	3 31 36.0	33 46.3	9.525 4834	64563
	11	22 37 16.9	5 28 2.8	− 9 48.2	−2 56 26.7	+36 30.5	9.519 1723	−61521
	12	28 9 45.2	5 36 50.6	8 0.7	2 18 39.6	39 1.0	9.513 2076	57629
	13	33 50 50.5	5 45 15.4	5 51.7	1 38 31.1	41 12.4	9.507 6758	52860
	14	39 40 5.0	5 53 7.3	3 25.2	0 56 23.2	42 58.7	9.502 6647	47216
	15	45 36 50.6	6 0 15.8	− 0 46.7	−0 12 44.0	44 14.1	9.498 2609	40722
	16	51 40 18.6	6 6 30.3	+ 1 56.7	+0 31 52.9	+44 53.4	9.494 5465	−33442
	17	57 49 29.8	6 11 40.5	4 37.3	1 16 49.3	44 52.4	9.491 5952	25480
	18	64 3 14.9	6 15 36.8	7 6.8	2 1 23.2	44 8.1	9.489 4686	16974
	19	70 20 16.1	6 18 11.3	9 16.9	2 44 50.9	42 40.0	9.488 2130	− 8092
	20	76 39 8.4	6 19 18.4	11 0.7	3 26 28.9	40 29.0	9.487 8563	+ 972
	21	82 58 22.7	6 18 54.9	+12 12.3	+4 5 35.7	+37 38.3	9.488 4066	+10012
	22	89 16 27.8	6 17 0.4	12 48.2	4 41 34.1	34 13.3	9.489 8513	18829
	23	95 31 54.2	6 13 38.0	12 47.2	5 13 53.1	30 20.7	9.492 1586	27233
	24	101 43 16.2	6 8 53.0	12 10.4	5 42 8.7	26 7.9	9.495 2786	35060
	25	107 49 15.3	6 2 53.5	11 1.0	6 6 4.8	21 43.0	9.499 1469	42179
	26	113 48 41.7	5 55 49.4	+ 9 24.0	+6 25 33.3	+17 14.0	9.503 6875	+48494
	27	119 40 36.4	5 47 51.9	7 25.3	6 40 33.6	12 47.6	9.508 8172	53953
	28	125 24 11.6	5 39 12.5	5 11.5	6 51 11.4	8 29.9	9.514 4488	58533
	29	130 58 51.3	5 30 2.8	2 49.5	6 57 37.8	4 25.5	9.520 4945	62240
	30	136 24 10.6	5 20 33.4	+ 0 25.2	7 0 8.1	+ 0 38.2	9.526 8688	65110
	31	141 39 54.7	5 10 54.1	− 1 55.7	+6 59 0.5	− 2 50.1	9.533 4904	+67195
Aug.	1	146 45 58.5	5 1 13.9	4 8.6	6 54 34.6	5 58.2	9.540 2838	68558
	2	151 42 24.6	4 51 39.9	6 10.0	6 47 10.8	8 45.9	9.547 1804	69270
	3	156 29 22.3	4 42 17.9	7 57.2	6 37 9.5	11 13.4	9.554 1187	69405
	4	161 7 6.1	4 33 12.8	9 28.4	6 24 50.4	13 21.7	9.561 0445	69033
	5	165 35 54.7	4 24 28.0	−10 42.8	+6 10 32.1	−15 12.1	9.567 9108	+68226
	6	169 56 9.7	4 16 6.0	11 39.9	5 54 31.7	16 46.0	9.574 6773	67047
	7	174 8 14.9	4 8 8.6	12 20.1	5 37 5.1	18 4.9	9.581 3096	65552
	8	178 12 35.3	4 0 36.6	12 43.9	5 18 26.3	19 10.5	9.587 7788	63794
	9	182 9 36.7	3 53 30.5	12 52.3	4 58 48.2	20 3.9	9.594 0611	61821
	10	185 59 44.9	3 46 50.2	−12 46.4	+4 38 22.0	−20 46.9	9.600 1371	+59673
	11	189 43 25.7	3 40 35.6	12 27.5	4 17 17.5	21 20.7	9.605 9909	57381
	12	193 21 4.4	3 34 45.9	11 57.0	3 55 43.4	21 46.3	9.611 6097	54979
	13	196 53 5.5	3 29 20.3	11 16.4	3 33 47.3	22 4.9	9.616 9837	52489
	14	200 19 52.9	3 24 18.3	10 26.4	3 11 35.7	22 17.4	9.622 1052	49931
	15	203 41 49.6	3 19 38.6	− 9 28.9	+2 49 14.3	−22 24.6	9.626 9684	+47325
	16	206 59 17.3	3 15 20.4	− 8 25.1	+2 26 48.0	−22 27.4	9.631 5690	+44683

FOR GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″		
g. 16	206 59 17.3	3 15 20.4	− 8 25.1	+2 26 48.0	−22 27.4	9.631 5690	+44683
17	210 12 37.3	3 11 22.9	7 16.2	2 4 20.9	22 26.2	9.635 9042	42019
18	213 22 9.6	3 7 44.9	6 3.1	1 41 56.7	22 21.7	9.639 9722	39339
19	216 28 13.4	3 4 25.8	4 47.1	1 19 38.5	22 14.2	9.643 7717	36651
20	219 31 7.1	3 1 24.5	3 29.1	0 57 29.1	22 4.2	9.647 3024	33964
21	222 31 8.1	2 58 40.3	− 2 9.9	+0 35 30.8	−21 52.1	9.650 5645	+31278
22	225 28 33.2	2 56 12.6	− 0 50.5	+0 13 45.6	21 38.0	9.653 5582	28598
23	228 23 38.5	2 54 0.6	+ 0 28.4	−0 7 44.7	21 22.3	9.656 2843	25926
24	231 16 39.4	2 52 3.7	1 46.1	0 28 58.5	21 5.1	9.658 7438	23265
25	234 7 50.7	2 50 21.3	3 1.9	0 49 54.4	20 46.5	9.660 9376	20612
26	236 57 26.7	2 48 53.0	+ 4 15.2	−1 10 31.1	−20 26.7	9.662 8666	+17970
27	239 45 41.3	2 47 38.4	5 25.5	1 30 47.5	20 5.8	9.664 5319	15338
28	242 32 48.0	2 46 37.1	6 32.2	1 50 42.4	19 43.8	9.665 9344	12714
29	245 18 59.8	2 45 48.7	7 34.7	2 10 14.8	19 20.8	9.667 0749	10098
30	248 4 29.5	2 45 12.9	8 32.7	2 29 23.6	18 56.7	9.667 9541	7488
31	250 49 29.8	2 44 49.7	+ 9 25.9	−2 48 7.8	−18 31.6	9.668 5727	+ 4885
pt. 1	253 34 13.0	2 44 38.8	10 13.7	3 6 26.4	18 5.4	9.668 9310	+ 2282
2	256 18 51.5	2 44 40.2	10 55.8	3 24 18.2	17 38.0	9.669 0292	− 318
3	259 3 37.5	2 44 58.8	11 31.9	3 41 42.1	17 9.6	9.668 8674	2918
4	261 48 43.2	2 45 19.6	12 1.7	3 58 36.9	16 39.8	9.668 4455	5520
5	264 34 20.7	2 45 57.6	+12 24.8	−4 15 1.2	−16 8.6	9.667 7632	− 8126
6	267 20 42.5	2 46 48.0	12 41.1	4 30 53.6	15 35.9	9.666 8201	10737
7	270 8 0.9	2 47 51.0	12 50.3	4 46 12.5	15 1.6	9.665 6156	13355
8	272 56 28.7	2 49 6.7	12 52.1	5 0 56.2	14 25.4	9.664 1489	15981
9	275 46 18.6	2 50 35.3	12 46.5	5 15 2.7	13 47.3	9.662 4191	18617
10	278 37 43.8	2 52 17.4	+12 33.3	−5 28 30.0	−13 7.0	9.660 4254	−21259
11	281 30 57.9	2 54 13.1	12 12.2	5 41 15.8	12 24.2	9.658 1668	23914
12	284 26 14.6	2 56 22.9	11 43.4	5 53 17.6	11 38.8	9.655 6423	26577
13	287 23 48.3	2 58 47.0	11 6.9	6 4 32.5	10 50.4	9.652 8508	29253
14	290 23 53.7	3 1 26.4	10 22.6	6 14 57.4	9 58.8	9.649 7915	31935
15	293 26 46.2	3 4 21.2	+ 9 30.6	−6 24 28.9	− 9 3.6	9.646 4638	−34622
16	296 32 41.6	3 7 32.3	8 31.3	6 33 3.2	8 4.4	9.642 8672	37311
17	299 41 56.5	3 11 0.3	7 24.8	6 40 36.3	7 1.0	9.639 0019	39995
18	302 54 48.0	3 14 45.7	6 11.5	6 47 3.6	5 52.8	9.634 8684	42672
19	306 11 34.0	3 18 49.3	4 52.1	6 52 20.1	4 39.3	9.630 4680	45332
20	309 32 32.9	3 23 11.8	+ 3 27.0	−6 56 20.4	− 3 20.3	9.625 8027	−47968
21	312 58 4.1	3 27 53.9	1 57.1	6 58 58.7	1 55.2	9.620 8758	50563
22	316 28 27.5	3 32 56.4	+ 0 23.4	7 0 8.6	− 0 23.5	9.615 6919	53105
23	320 4 3.8	3 38 19.8	− 1 13.0	6 59 43.3	+ 1 15.4	9.610 2571	55577
24	323 45 14.2	3 44 4.7	2 50.7	6 57 35.4	3 1.7	9.604 5796	57955
25	327 32 20.6	3 50 11.8	− 4 28.1	−6 53 37.3	+ 4 56.0	9.598 6700	−60215
26	331 25 45.2	3 56 41.3	6 3.4	6 47 40.7	6 58.6	9.592 5417	62324
27	335 25 50.6	4 3 33.2	7 34.5	6 39 37.3	9 9.8	9.586 2115	64247
28	339 32 59.1	4 10 47.6	8 59.0	6 29 18.3	11 29.7	9.579 6999	65944
29	343 47 33.2	4 18 24.1	10 14.6	6 16 35.1	13 58.1	9.573 0318	67368
30	348 9 54.3	4 26 21.5	−11 18.4	−6 1 19.3	+16 34.8	9.566 2373	−68463
t. 1	352 40 22.8	4 34 38.7	−12 7.8	−5 43 23.0	+19 19.0	9.559 3523	−69170

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	V
		° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″		
Oct.	1	352 40 22.8	4 34 38.7	−12 7.8	−5 43 23.0	+19 19.0	9.559 3523	−
	2	357 19 17.5	4 43 13.4	12 40.0	5 22 39.3	22 9.4	9.552 4187	
	3	2 6 54.5	4 52 2.9	12 52.3	4 59 2.7	25 4.5	9.545 4852	
	4	7 3 27.0	5 1 3.6	12 42.4	4 32 29.5	28 2.0	9.538 6077	
	5	12 9 3.8	5 10 10.6	12 8.4	4 2 58.9	30 58.9	9.531 8495	
	6	17 23 48.4	5 19 18.2	−11 9.4	−3 30 33.1	+33 51.6	9.525 2811	−
	7	22 47 38.1	5 28 19.6	9 45.2	2 55 18.7	36 35.4	9.518 9792	
	8	28 20 22.9	5 37 6.8	7 57.0	2 17 26.9	39 5.5	9.513 0264	
	9	34 1 44.0	5 45 30.8	5 47.3	1 37 14.2	41 16.2	9.507 5092	
	10	39 51 13.4	5 53 21.5	3 20.4	0 55 3.0	43 1.5	9.502 5154	
	11	45 48 12.5	6 0 28.5	− 0 41.7	−0 11 21.5	+44 15.8	9.498 1318	−
	12	51 51 52.4	6 6 41.3	+ 2 1.8	+0 33 16.6	44 53.9	9.494 4399	
	13	58 1 13.5	6 11 49.3	4 42.2	1 18 12.9	44 51.7	9.491 5132	
	14	64 15 6.2	6 15 43.1	7 11.1	2 2 45.5	44 6.2	9.489 4132	
	15	70 32 12.4	6 18 15.1	9 20.6	2 46 10.5	42 36.6	9.488 1853	−
	16	76 51 7.1	6 19 19.3	+11 3.4	+3 27 44.4	+40 24.3	9.487 8567	+
	17	83 10 20.8	6 18 53.0	12 13.9	4 6 45.9	37 32.5	9.488 4351	
	18	89 28 22.7	6 16 55.9	12 48.7	4 42 38.0	34 6.4	9.489 9073	
	19	95 43 43.0	6 13 30.6	12 46.6	5 14 49.7	30 12.9	9.492 2408	
	20	101 54 56.4	6 8 43.1	12 8.7	5 42 57.5	25 59.8	9.495 3854	
	21	108 0 44.4	6 2 41.4	+10 58.4	+6 6 45.4	+21 34.7	9.499 2760	+
	22	113 59 57.8	5 55 35.6	9 20.5	6 26 5.5	17 5.5	9.503 8364	
	23	119 51 37.8	5 47 36.5	7 21.2	6 40 57.4	12 39.4	9.508 9833	
	24	125 34 57.0	5 38 56.0	5 7.2	6 51 27.2	8 22.0	9.514 6295	
	25	131 9 19.7	5 29 45.3	2 45.0	6 57 46.0	4 18.1	9.520 6870	
	26	136 34 21.2	5 20 15.4	+ 0 20.7	+7 0 9.2	+ 0 31.4	9.527 0704	+
	27	141 49 47.4	5 10 36.1	− 2 0.0	6 58 55.1	− 2 56.3	9.533 6988	
	28	146 55 33.1	5 0 56.0	4 12.6	6 54 23.3	6 3.8	9.540 4968	
	29	151 51 41.4	4 51 22.2	6 13.6	6 46 54.3	8 50.8	9.547 3957	
	30	156 38 21.6	4 42 0.7	8 0.3	6 36 48.4	11 17.7	9.554 3345	
	31	161 15 48.4	4 32 56.1	− 9 31.0	+6 24 25.3	−13 25.4	9.561 2594	+
Nov.	1	165 44 20.6	4 24 12.0	10 44.8	6 10 3.6	15 15.2	9.568 1234	
	2	170 4 20.0	4 15 50.8	11 41.4	5 54 0.3	16 48.8	9.574 8863	
	3	174 16 10.3	4 7 54.1	12 21.1	5 36 31.1	18 7.2	9.581 5139	
	4	178 20 16.6	4 0 22.9	12 44.4	5 17 50.4	19 12.2	9.587 9777	
	5	182 17 4.7	3 53 17.5	−12 52.3	+4 58 10.6	−20 5.5	9.594 2540	+
	6	186 7 0.3	3 46 38.2	12 46.0	4 37 43.0	20 48.1	9.600 3234	
	7	189 50 29.5	3 40 24.3	12 26.8	4 16 37.5	21 21.5	9.606 1702	
	8	193 27 57.2	3 34 35.2	11 55.9	3 55 2.6	21 47.0	9.611 7817	
	9	196 59 48.1	3 29 10.6	11 14.7	3 33 5.9	22 5.4	9.617 1479	
	10	200 26 26.1	3 24 9.2	−10 24.7	+3 10 53.9	−22 17.7	9.622 2613	+
	11	203 48 13.9	3 19 30.2	9 27.0	2 48 32.3	22 24.7	9.627 1163	
	12	207 5 33.6	3 15 12.7	8 23.1	2 26 5.9	22 27.4	9.631 7088	
	13	210 18 46.2	3 11 15.7	7 13.9	2 3 38.8	22 26.1	9.636 0359	
	14	213 28 11.6	3 7 38.3	6 0.8	1 41 14.8	22 21.4	9.640 0955	
	15	216 34 9.1	3 4 19.8	− 4 44.7	+1 18 56.9	−22 13.9	9.643 8866	+
	16	*219 36 57.1*	3 1 19.0	− 3 26.6	+0 56 47.8	−22 3.9	9.647 4090	+

FOR GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″		
16	219 36 57.1	3 1 19.0	− 3 26.6	+0 56 47.8	−22 3.9	9.647 4090	+33881
17	222 36 52.9	2 58 35.4	2 7.4	0 34 49.9	21 51.7	9.650 6627	31195
18	225 34 13.4	2 56 8.2	− 0 48.0	+0 13 5.1	21 37.6	9.653 6481	28515
19	228 29 14.5	2 53 56.6	+ 0 30.9	−0 8 24.7	21 21.8	9.656 3659	25843
20	231 22 11.7	2 52 0.2	1 48.5	0 29 37.9	21 4.5	9.658 8171	23182
21	234 13 19.8	2 50 18.3	+ 3 4.3	−0 50 33.2	−20 46.0	9.661 0026	+20530
22	237 2 53.0	2 48 50.5	4 17.5	1 11 9.4	20 26.2	9.662 9234	17887
23	239 51 5.3	2 47 36.3	5 27.6	1 31 25.1	20 5.1	9.664 5804	15254
24	242 38 10.0	2 46 35.3	6 34.2	1 51 19.3	19 43.1	9.665 9747	12633
25	245 24 20.2	2 45 47.3	7 36.6	2 10 51.0	19 20.1	9.667 1071	10017
26	248 9 48.8	2 45 12.0	+ 8 34.5	−2 29 59.1	−18 55.9	9.667 9782	+ 7407
27	250 54 48.3	2 44 49.1	9 27.5	2 48 42.5	18 30.7	9.668 5886	4801
28	253 39 31.2	2 44 38.7	10 15.1	3 7 0.2	18 4.5	9.668 9387	+ 2201
29	256 24 9.8	2 44 40.4	10 57.1	3 24 51.2	17 37.2	9.669 0288	− 399
30	259 8 56.1	2 44 54.4	11 33.0	3 42 14.2	17 8.7	9.668 8589	3000
1	261 54 2.6	2 45 20.6	+12 2.5	−3 59 8.1	−16 38.8	9.668 4289	− 5601
2	264 39 41.3	2 45 58.9	12 25.4	4 15 31.4	16 7.5	9.667 7385	8207
3	267 26 4.6	2 46 49.8	12 41.5	4 31 22.7	15 34.8	9.666 7872	10819
4	270 13 25.1	2 47 53.1	12 50.4	4 46 40.5	15 0.5	9.665 5745	13437
5	273 1 55.1	2 49 9.2	12 52.0	5 1 23.1	14 24.3	9.664 0996	16063
6	275 51 47.8	2 50 38.3	+12 46.2	−5 15 28.5	−13 46.1	9.662 3616	−18698
7	278 43 16.2	2 52 20.7	12 32.7	5 28 54.6	13 5.6	9.660 3597	21342
8	281 36 33.8	2 54 16.8	12 11.4	5 41 39.0	12 22.8	9.658 0928	23998
9	284 31 54.5	2 56 27.0	11 42.4	5 53 39.3	11 37.4	9.655 5598	26663
10	287 29 32.7	2 58 51.8	11 5.6	6 4 52.7	10 48.9	9.652 7599	29337
11	290 29 43.1	3 1 31.5	+10 21.1	−6 15 16.0	− 9 57.2	9.649 6922	−32018
12	293 32 41.0	3 4 26.9	9 28.9	6 24 45.8	9 1.8	9.646 3561	34705
13	296 38 42.4	3 7 38.6	8 29.3	6 33 18.3	8 2.5	9.642 7512	37394
14	299 48 3.8	3 11 7.0	7 22.6	6 40 49.4	6 58.9	9.638 8775	39079
15	303 1 2.3	3 14 53.0	6 9.2	6 47 14.5	5 50.5	9.634 7357	42756
16	306 17 55.8	3 18 57.2	+ 4 49.5	−6 52 28.7	− 4 37.0	9.630 3269	−45417
17	309 39 2.9	3 23 20.3	3 24.2	6 56 26.6	3 17.8	9.625 6533	48050
18	313 4 42.9	3 28 3.1	1 54.2	6 59 2.3	1 52.4	9.620 7183	50643
19	316 35 15.8	3 33 6.1	+ 0 20.4	7 0 9.3	− 0 20.5	9.615 5265	53184
20	320 11 2.1	3 38 30.2	− 1 16.1	6 59 40.9	+ 1 18.5	9.610 0840	55653
21	323 52 23.3	3 44 15.8	− 2 53.8	−6 57 29.7	+ 3 5.1	9.604 3991	−58027
22	327 39 41.1	3 50 23.6	4 31.1	6 53 28.0	4 59.7	9.598 4826	60281
23	331 33 17.9	3 56 53.8	6 6.3	6 47 27.6	7 2.5	9.592 3479	62385
24	335 33 36.1	4 3 46.4	7 37.2	6 39 20.1	9 14.0	9.586 0117	64304
25	339 40 58.1	4 11 1.5	9 1.5	6 28 56.7	11 34.2	9.579 4947	65994
26	343 55 46.4	4 18 38.6	−10 16.7	−6 16 8.9	+14 2.8	9.572 8221	−67407
27	348 18 22.3	4 26 36.8	11 20.2	6 0 48.3	16 39.8	9.566 0242	68491
28	352 49 6.4	4 34 54.5	12 9.1	5 42 46.9	19 24.2	9.559 1369	69185
29	357 28 17.1	4 43 29.7	12 40.7	5 21 57.9	22 14.8	9.552 2025	69422
30	2 16 10.6	4 52 19.7	12 52.3	4 58 15.8	25 10.0	9.545 2699	69137
31	7 12 59.9	5 1 20.6	−12 41.7	−4 31 37.1	+28 7.5	9.538 3951	−68254
32	12 18 53.7	....	−12 6.9	−4 2 0.9	.....	9.531 6416	....

VENUS, 1916.

GREENWICH MEAN TIME.

Date.		Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
		Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
		h m s	s	° ′ ″	″			″	″	h m
Jan.	1	20 39 32.04	+12.800	−20 10 44.7	+46.71	0.159 5504	−567.6	5.92	6.10	2 0.4
	2	20 44 38.57	12.744	19 51 46.4	48.14	0.158 1810	573.6	5.93	6.11	2 1.6
	3	20 49 43.75	12.688	19 32 14.2	49.54	0.156 7971	579.7	5.95	6.13	2 2.7
	4	20 54 47.57	12.631	19 12 8.8	50.90	0.155 3984	585.9	5.97	6.15	2 3.8
	5	20 59 50.01	12.573	18 51 31.1	52.23	0.153 9847	592.2	5.99	6.17	2 4.9
	6	21 4 51.06	+12.515	−18 30 21.8	+53.53	0.152 5557	−598.6	6.01	6.19	2 6.0
	7	21 9 50.72	12.457	18 8 41.7	54.80	0.151 1113	605.0	6.03	6.21	2 7.0
	8	21 14 48.98	12.398	17 46 31.5	56.04	0.149 6515	611.5	6.05	6.23	2 8.0
	9	21 19 45.83	12.339	17 23 52.0	57.24	0.148 1761	618.0	6.07	6.25	2 9.0
	10	21 24 41.28	12.281	17 0 44.1	58.41	0.146 6849	624.6	6.09	6.27	2 10.0
	11	21 29 35.34	+12.224	−16 37 8.5	+59.55	0.145 1779	−631.3	6.12	6.30	2 11.0
	12	21 34 28.01	12.166	16 13 6.0	60.65	0.143 6548	638.0	6.14	6.32	2 11.9
	13	21 39 19.29	12.108	15 48 37.5	61.72	0.142 1157	644.7	6.16	6.34	2 12.8
	14	21 44 9.21	12.051	15 23 43.7	62.76	0.140 5605	651.4	6.18	6.36	2 13.7
	15	21 48 57.77	11.995	14 58 25.4	63.76	0.138 9891	658.2	6.20	6.38	2 14.6
	16	21 53 44.98	+11.940	−14 32 43.4	+64.73	0.137 4014	−665.0	6.23	6.41	2 15.4
	17	21 58 30.88	11.885	14 6 38.6	65.67	0.135 7973	671.8	6.25	6.43	2 16.2
	18	22 3 15.47	11.831	13 40 11.7	66.57	0.134 1766	678.7	6.27	6.45	2 17.0
	19	22 7 58.79	11.779	13 13 23.4	67.44	0.132 5393	685.7	6.30	6.48	2 17.8
	20	22 12 40.85	11.727	12 46 14.6	68.28	0.130 8852	692.7	6.33	6.51	2 18.6
	21	22 17 21.68	+11.676	−12 18 46.0	+69.09	0.129 2142	−699.8	6.35	6.54	2 19.3
	22	22 22 1.30	11.626	11 50 58.5	69.86	0.127 5260	707.0	6.38	6.57	2 20.0
	23	22 26 39.75	11.578	11 22 52.8	70.60	0.125 8207	714.2	6.40	6.59	2 20.7
	24	22 31 17.05	11.531	10 54 29.6	71.31	0.124 0980	721.5	6.43	6.62	2 21.4
	25	22 35 53.24	11.485	10 25 49.8	71.99	0.122 3576	728.9	6.45	6.65	2 22.0
	26	22 40 28.35	+11.441	− 9 56 54.1	+72.64	0.120 5993	−736.4	6.48	6.67	2 22.6
	27	22 45 2.41	11.398	9 27 43.3	73.25	0.118 8229	744.0	6.51	6.69	2 23.3
	28	22 49 35.45	11.356	8 58 18.1	73.83	0.117 0282	751.7	6.53	6.72	2 23.9
	29	22 54 7.52	11.316	8 28 39.3	74.39	0.115 2148	759.5	6.56	6.75	2 24.5
	30	22 58 38.64	11.277	7 58 47.6	74.91	0.113 3823	767.5	6.58	6.78	2 25.1
	31	23 3 8.84	+11.240	− 7 28 43.9	+75.40	0.111 5306	−775.6	6.61	6.81	2 25.6
Feb.	1	23 7 38.17	11.205	6 58 28.9	75.85	0.109 6593	783.9	6.64	6.84	2 26.1
	2	23 12 6.66	11.170	6 28 3.4	76.27	0.107 7680	792.3	6.67	6.87	2 26.7
	3	23 16 34.34	11.137	5 57 28.1	76.66	0.105 8562	800.9	6.70	6.90	2 27.2
	4	23 21 1.25	11.105	5 26 43.9	77.02	0.103 9238	809.5	6.73	6.93	2 27.7
	5	23 25 27.41	+11.075	− 4 55 51.5	+77.35	0.101 9705	−818.3	6.76	6.96	2 28.2
	6	23 29 52.86	11.046	4 24 51.6	77.64	0.099 9959	827.2	6.79	6.99	2 28.7
	7	23 34 17.64	11.019	3 53 45.1	77.90	0.097 9997	836.3	6.82	7.02	2 29.2
	8	23 38 41.79	10.993	3 22 32.7	78.13	0.095 9817	845.4	6.85	7.05	2 29.7
	9	23 43 5.33	10.969	2 51 15.2	78.32	0.093 9418	854.6	6.88	7.08	2 30.2
	10	23 47 28.29	+10.946	− 2 19 53.3	+78.48	0.091 8797	−863.9	6.92	7.12	2 30.6
	11	23 51 50.72	10.924	1 48 27.8	78.62	0.089 7952	873.2	6.95	7.15	2 31.0
	12	23 56 12.65	10.904	1 16 59.5	78.73	0.087 6882	882.7	6.99	7.18	2 31.4
	13	0 0 34.12	10.885	0 45 29.0	78.81	0.085 5582	892.3	7.02	7.22	2 31.8
	14	0 4 55.16	10.868	− 0 13 57.0	78.85	0.083 4052	901.9	7.06	7.26	2 32.2
	15	0 9 15.82	+10.853	+ 0 17 35.6	+78.86	0.081 2291	−911.6	7.09	7.30	2 32.6
	16	*0 13 36.12*	*+10.839*	+ 0 49 8.2	+78.84	0.079 0295	−921.5	7.12	7.33	2 33.0

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h m
eb. 16	0 13 36.12	+10.839	+ 0 49 8.2	+78.84	0.079 0295	− 921.5	7.12	7.33	2 33.0
17	0 17 56.10	10.827	1 20 40.0	78.80	0.076 8061	931.4	7.16	7.37	2 33.4
18	0 22 15.81	10.816	1 52 10.4	78.73	0.074 5587	941.4	7.20	7.41	2 33.8
19	0 26 35.27	10.807	2 23 38.7	78.62	0.072 2873	951.5	7.24	7.45	2 34.2
20	0 30 54.53	10.799	2 55 4.1	78.49	0.069 9915	961.7	7.28	7.49	2 34.5
21	0 35 13.62	+10.793	+ 3 26 26.0	+78.33	0.067 6712	− 972.0	7.32	7.53	2 34.9
22	0 39 32.59	10.788	3 57 43.7	78.14	0.065 3259	982.5	7.36	7.57	2 35.3
23	0 43 51.46	10.785	4 28 56.4	77.92	0.062 9553	993.1	7.40	7.61	2 35.7
24	0 48 10.27	10.783	5 0 3.6	77.67	0.060 5591	1003.8	7.44	7.65	2 36.0
25	0 52 29.06	10.783	5 31 4.5	77.39	0.058 1370	1014.7	7.48	7.70	2 36.4
26	0 56 47.87	+10.784	+ 6 1 58.5	+77.09	0.055 6885	−1025.8	7.52	7.74	2 36.8
27	1 1 6.72	10.787	6 32 44.8	76.76	0.053 2134	1037.0	7.57	7.78	2 37.2
28	1 5 25.66	10.792	7 3 22.7	76.40	0.050 7111	1048.4	7.61	7.82	2 37.5
29	1 9 44.72	10.797	7 33 51.7	76.01	0.048 1811	1060.0	7.66	7.87	2 37.9
ar. 1	1 14 3.93	10.804	8 4 11.0	75.59	0.045 6230	1071.9	7.70	7.92	2 38.3
2	1 18 23.31	+10.811	+ 8 34 19.8	+75.14	0.043 0361	−1084.0	7.74	7.97	2 38.7
3	1 22 42.88	10.820	9 4 17.5	74.66	0.040 4201	1096.2	7.79	8.02	2 39.0
4	1 27 2.68	10.830	9 34 3.3	74.15	0.037 7744	1108.6	7.84	8.07	2 39.4
5	1 31 22.72	10.841	10 3 36.5	73.61	0.035 0987	1121.3	7.89	8.12	2 39.8
6	1 35 43.03	10.852	10 32 56.5	73.04	0.032 3923	1134.1	7.94	8.17	2 40.2
7	1 40 3.61	+10.864	+11 2 2.5	+72.45	0.029 6550	−1147.1	7.99	8.22	2 40.6
8	1 44 24.50	10.877	11 30 53.8	71.82	0.026 8862	1160.3	8.04	8.27	2 41.0
9	1 48 45.72	10.891	11 59 29.7	71.16	0.024 0855	1173.7	8.09	8.32	2 41.4
10	1 53 7.27	10.905	12 27 49.5	70.48	0.021 2525	1187.2	8.14	8.38	2 41.8
11	1 57 29.17	10.920	12 55 52.6	69.77	0.018 3869	1200.9	8.20	8.44	2 42.3
12	2 1 51.43	+10.935	+13 23 38.3	+69.03	0.015 4883	−1214.7	8.25	8.49	2 42.7
13	2 6 14.07	10.951	13 51 5.9	68.26	0.012 5564	1228.7	8.30	8.55	2 43.1
14	2 10 37.09	10.967	14 18 14.7	67.46	0.009 5907	1242.8	8.36	8.61	2 43.5
15	2 15 0.50	10.983	14 45 4.0	66.64	0.006 5911	1257.0	8.42	8.67	2 44.0
16	2 19 24.31	11.000	15 11 33.2	65.79	0.003 5571	1271.4	8.48	8.73	2 44.5
17	2 23 48.52	+11.017	+15 37 41.8	+64.91	0.000 4883	−1286.0	8.54	8.79	2 45.0
18	2 28 13.14	11.035	16 3 29.0	64.01	9.997 3842	1300.8	8.60	8.85	2 45.5
19	2 32 38.18	11.052	16 28 54.2	63.08	9.994 2446	1315.7	8.66	8.91	2 45.9
20	2 37 3.63	11.069	16 53 56.8	62.13	9.991 0690	1330.7	8.72	8.98	2 46.4
21	2 41 29.50	11.086	17 18 36.2	61.15	9.987 8572	1345.9	8.79	9.05	2 46.9
22	2 45 55.78	+11.103	+17 42 51.8	+60.14	9.984 6088	−1361.3	8.86	9.12	2 47.4
23	2 50 22.46	11.120	18 6 43.0	59.11	9.981 3232	1376.8	8.93	9.19	2 47.9
24	2 54 49.55	11.137	18 30 9.2	58.06	9.978 0000	1392.6	9.00	9.26	2 48.4
25	2 59 17.05	11.154	18 53 9.9	56.99	9.974 6386	1408.7	9.06	9.33	2 48.9
26	3 3 44.93	11.170	19 15 44.6	55.89	9.971 2383	1425.0	9.13	9.40	2 49.4
27	3 8 13.19	+11.185	+19 37 52.6	+54.77	9.967 7987	−1441.5	9.20	9.47	2 49.9
28	3 12 41.81	11.199	19 59 33.4	53.62	9.964 3192	1458.3	9.27	9.55	2 50.4
29	3 17 10.77	11.213	20 20 46.4	52.45	9.960 7990	1475.3	9.35	9.63	2 51.0
30	3 21 40.05	11.226	20 41 31.1	51.26	9.957 2374	1492.8	9.43	9.71	2 51.6
31	3 26 9.62	11.237	21 1 47.0	50.05	9.953 6337	1510.5	9.51	9.79	2 52.1
r. 1	3 30 39.44	+11.247	+21 21 33.6	+48.82	9.949 9871	−1528.5	9.59	9.87	2 52.6
2	3 35 9.48	+11.255	+21 40 50.3	+47.57	9.946 2970	−1546.8	9.67	9.95	2 53.2

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″			″	″	h m
Apr. 1	3 30 39.44	+11.247	+21 21 33.6	+48.82	9.949 9871	−1528.5	9.59	9.87	2 52.6
2	3 35 9.48	11.255	21 40 50.3	47.57	9.946 2970	1546.8	9.67	9.95	2 53.2
3	3 39 39.71	11.262	21 59 36.7	46.29	9.942 5626	1565.3	9.75	10.04	2 53.8
4	3 44 10.07	11.267	22 17 52.3	45.00	9.938 7832	1584.2	9.84	10.13	2 54.4
5	3 48 40.52	11.270	22 35 36.7	43.69	9.934 9581	1603.4	9.93	10.22	2 55.0
6	3 53 11.01	+11.270	+22 52 49.5	+42.36	9.931 0867	−1622.8	10.02	10.31	2 55.5
7	3 57 41.48	11.268	23 9 30.2	41.02	9.927 1683	1642.5	10.11	10.40	2 56.0
8	4 2 11.88	11.264	23 25 38.4	39.66	9.923 2025	1662.4	10.20	10.50	2 56.6
9	4 6 42.14	11.257	23 41 13.8	38.29	9.919 1886	1682.6	10.29	10.60	2 57.2
10	4 11 12.19	11.247	23 56 16.2	36.90	9.915 1259	1703.0	10.39	10.70	2 57.7
11	4 15 41.97	+11.234	+24 10 45.1	+35.50	9.911 0138	−1723.7	10.49	10.80	2 58.2
12	4 20 11.42	11.219	24 24 40.3	34.09	9.906 8518	1744.7	10.59	10.90	2 58.8
13	4 24 40.46	11.200	24 38 1.5	32.67	9.902 6392	1765.9	10.69	11.01	2 59.4
14	4 29 9.00	11.178	24 50 48.5	31.25	9.898 3756	1787.3	10.79	11.12	2 59.9
15	4 33 36.97	11.153	25 3 1.2	29.81	9.894 0604	1808.8	10.90	11.23	3 0.4
16	4 38 4.30	+11.124	+25 14 39.4	+28.37	9.889 6932	−1830.6	11.01	11.34	3 0.9
17	4 42 30.89	11.092	25 25 42.9	26.92	9.885 2733	1852.6	11.12	11.46	3 1.4
18	4 46 56.67	11.056	25 36 11.7	25.47	9.880 8004	1874.8	11.24	11.58	3 1.9
19	4 51 21.54	11.016	25 46 5.6	24.02	9.876 2739	1897.3	11.36	11.70	3 2.4
20	4 55 45.42	10.973	25 55 24.6	22.57	9.871 6933	1920.0	11.48	11.82	3 2.9
21	5 0 8.22	+10.926	+26 4 8.8	+21.11	9.867 0580	−1942.9	11.61	11.95	3 3.3
22	5 4 29.84	10.875	26 12 18.1	19.66	9.862 3674	1966.0	11.74	12.08	3 3.7
23	5 8 50.19	10.820	26 19 52.6	18.21	9.857 6208	1989.5	11.87	12.21	3 4.1
24	5 13 9.18	10.761	26 26 52.3	16.76	9.852 8174	2013.4	12.00	12.34	3 4.5
25	5 17 26.70	10.698	26 33 17.3	15.32	9.847 9565	2037.6	12.13	12.48	3 4.8
26	5 21 42.64	+10.630	+26 39 7.9	+13.89	9.843 0372	−2062.0	12.27	12.62	3 5.1
27	5 25 56.90	10.558	26 44 24.1	12.46	9.838 0588	2086.8	12.41	12.77	3 5.4
28	5 30 9.37	10.481	26 49 6.2	11.04	9.833 0206	2111.9	12.55	12.92	3 5.7
29	5 34 19.92	10.398	26 53 14.3	9.63	9.827 9217	2137.3	12.70	13.07	3 5.9
30	5 38 28.43	10.310	26 56 48.7	8.24	9.822 7612	2163.1	12.85	13.23	3 6.1
May 1	5 42 34.77	+10.217	+26 59 49.8	+ 6.86	9.817 5383	−2189.3	13.01	13.39	3 6.3
2	5 46 38.82	10.119	27 2 17.9	5.49	9.812 2523	2215.8	13.17	13.56	3 6.4
3	5 50 40.44	10.015	27 4 13.3	4.14	9.806 9024	2242.5	13.33	13.73	3 6.5
4	5 54 39.48	9.905	27 5 36.5	2.80	9.801 4881	2269.5	13.50	13.90	3 6.5
5	5 58 35.81	9.789	27 6 27.8	1.48	9.796 0087	2296.7	13.67	14.08	3 6.5
6	6 2 29.29	+ 9.667	+27 6 47.8	+ 0.19	9.790 4639	−2324.1	13.85	14.26	3 6.4
7	6 6 19.76	9.538	27 6 37.0	− 1.08	9.784 8531	2351.7	14.03	14.45	3 6.3
8	6 10 7.06	9.403	27 5 55.9	2.33	9.779 1759	2379.4	14.21	14.64	3 6.2
9	6 13 51.05	9.262	27 4 45.0	3.56	9.773 4321	2407.2	14.40	14.83	3 6.0
10	6 17 31.57	9.114	27 3 5.1	4.76	9.767 6215	2435.0	14.59	15.03	3 5.7
11	6 21 8.46	+ 8.959	+27 0 56.7	− 5.93	9.761 7440	−2462.9	14.79	15.23	3 5.4
12	6 24 41.54	8.797	26 58 20.4	7.08	9.755 7997	2490.7	14.99	15.44	3 5.0
13	6 28 10.64	8.627	26 55 17.0	8.19	9.749 7887	2518.4	15.20	15.66	3 4.5
14	6 31 35.60	8.451	26 51 47.2	9.27	9.743 7115	2545.9	15.42	15.88	3 3.9
15	6 34 56.25	8.268	26 47 51.7	10.33	9.737 5684	2573.2	15.64	16.10	3 3.3
16	6 38 12.42	+ 8.077	+26 43 31.3	−11.36	9.731 3602	−2600.2	15.86	16.33	3 2.6
17	*6 41 23.92*	*+ 7.879*	+26 38 46.7	−12.35	9.725 0877	−2626.8	16.09	16.57	3 1.8

GREENWICH MEAN TIME.

Date.		Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
		Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	
		h m s	s	° ′ ″	″			″	″	h m
ay	17	6 41 23.92	+7.879	+26 38 46.7	−12.35	9.725 0877	−2626.8	16.09	16.57	3 1.8
	18	6 44 30.57	7.674	26 33 38.6	13.31	9.718 7519	2653.0	16.33	16.82	3 1.0
	19	6 47 32.21	7.461	26 28 7.9	14.23	9.712 3538	2678.7	16.57	17.07	3 0.1
	20	6 50 28.64	7.240	26 22 15.5	15.12	9.705 8946	2703.8	16.82	17.32	2 59.1
	21	6 53 19.68	7.012	26 16 2.2	15.98	9.699 3758	2728.3	17.07	17.58	2 58.0
	22	6 56 5.15	+6.776	+26 9 28.7	−16.80	9.692 7989	−2752.2	17.33	17.85	2 56.8
	23	6 58 44.85	6.531	26 2 35.8	17.59	9.686 1656	2775.3	17.60	18.12	2 55.5
	24	7 1 18.58	6.278	25 55 24.4	18.34	9.679 4779	2797.6	17.87	18.40	2 54.1
	25	7 3 46.13	6.016	25 47 55.4	19.06	9.672 7379	2818.9	18.15	18.69	2 52.6
	26	7 6 7.28	5.746	25 40 9.6	19.74	9.665 9482	2839.0	18.43	18.98	2 51.0
	27	7 8 21.84	+5.466	+25 32 7.9	−20.39	9.659 1115	−2857.9	18.73	19.28	2 49.3
	28	7 10 29.58	5.177	25 23 51.2	21.00	9.652 2313	2875.3	19.03	19.60	2 47.5
	29	7 12 30.26	4.878	25 15 20.3	21.57	9.645 3112	2891.1	19.34	19.91	2 45.6
	30	7 14 23.63	4.569	25 6 36.2	22.10	9.638 3554	2905.0	19.65	20.23	2 43.5
	31	7 16 9.46	4.250	24 57 39.8	22.60	9.631 3686	2916.8	19.97	20.56	2 41.3
ne	1	7 17 47.50	+3.920	+24 48 31.8	−23.06	9.624 3562	−2926.3	20.30	20.89	2 39.0
	2	7 19 17.51	3.579	24 39 13.2	23.48	9.617 3242	2933.1	20.63	21.24	2 36.5
	3	7 20 39.22	3.229	24 29 44.9	23.87	9.610 2795	2936.9	20.97	21.59	2 33.9
	4	7 21 52.40	2.869	24 20 7.6	24.23	9.603 2297	2937.4	21.31	21.94	2 31.2
	5	7 22 56.81	2.498	24 10 22.2	24.55	9.596 1831	2934.1	21.66	22.30	2 28.3
	6	7 23 52.20	+2.117	+24 0 29.4	−24.84	9.589 1491	−2926.8	22.01	22.66	2 25.3
	7	7 24 38.32	1.726	23 50 30.0	25.10	9.582 1378	2915.1	22.37	23.03	2 22.1
	8	7 25 14.95	1.325	23 40 24.8	25.33	9.575 1603	2898.5	22.73	23.41	2 18.8
	9	7 25 41.87	0.916	23 30 14.3	25.54	9.568 2289	2876.7	23.10	23.79	2 15.3
	10	7 25 58.88	0.499	23 19 59.2	25.72	9.561 3568	2849.0	23.48	24.16	2 11.6
	11	7 26 5.81	+0.076	+23 9 40.1	−25.87	9.554 5587	−2815.0	23.85	24.54	2 7.8
	12	7 26 2.50	−0.353	22 59 17.5	26.00	9.547 8502	2774.3	24.22	24.92	2 3.8
	13	7 25 48.83	0.787	22 48 52.0	26.12	9.541 2479	2726.4	24.59	25.31	1 59.6
	14	7 25 24.72	1.224	22 38 24.0	26.22	9.534 7697	2670.8	24.95	25.69	1 55.2
	15	7 24 50.11	1.661	22 27 53.8	26.30	9.528 4345	2607.2	25.32	26.06	1 50.7
	16	7 24 5.02	−2.097	+22 17 21.8	−26.37	9.522 2619	−2535.2	25.68	26.44	1 46.0
	17	7 23 9.51	2.529	22 6 48.2	26.43	9.516 2726	2454.5	26.03	26.80	1 41.2
	18	7 22 3.69	2.955	21 56 13.3	26.48	9.510 4877	2364.8	26.38	27.16	1 36.1
	19	7 20 47.74	3.373	21 45 37.3	26.52	9.504 9289	2266.0	26.72	27.52	1 30.9
	20	7 19 21.89	3.780	21 35 0.6	26.54	9.499 6179	2158.2	27.06	27.85	1 25.6
	21	7 17 46.44	−4.172	+21 24 23.4	−26.56	9.494 5768	−2041.2	27.38	28.18	1 20.1
	22	7 16 1.76	4.548	21 13 46.1	26.55	9.489 8276	1915.0	27.68	28.49	1 14.4
	23	7 14 8.30	4.904	21 3 9.2	26.52	9.485 3922	1779.7	27.96	28.78	1 8.6
	24	7 12 6.57	5.237	20 52 33.1	26.48	9.481 2920	1635.7	28.22	29.05	1 2.6
	25	7 9 57.13	5.545	20 41 58.4	26.40	9.477 5476	1483.3	28.47	29.30	0 56.5
	26	7 7 40.64	−5.824	+20 31 26.0	−26.29	9.474 1785	−1323.0	28.70	29.53	0 50.3
	27	7 5 17.82	6.072	20 20 56.7	26.15	9.471 2028	1155.5	28.90	29.74	0 44.0
	28	7 2 49.47	6.285	20 10 31.4	25.96	9.468 6371	981.5	29.07	29.91	0 37.6
	29	7 0 16.43	6.462	20 0 11.4	25.71	9.466 4963	801.7	29.21	30.06	0 31.2
	30	6 57 39.58	6.602	19 49 57.9	25.40	9.464 7928	617.2	29.32	30.18	0 24.7
ly	1	6 54 59.87	−6.701	+19 39 52.5	−25.03	9.463 5367	− 429.0	29.41	30.26	0 18.1
	2	6 52 18.27	−6.759	+19 29 56.7	−24.60	9.462 7354	− 238.3	29.46	30.32	0 11.5

VENUS, 1916.

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Paral-lax.
	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.
	h m s	s	° ′ ″	″			″	″
July 1	6 54 59.87	−6.701	+19 39 52.5	−25.03	9.463 5367	− 429.0	29.41	30.26
2	6 52 18.27	6.759	19 29 56.7	24.60	9.462 7354	238.3	29.46	30.32
3	6 49 35.77	6.775	19 20 12.1	24.10	9.462 3937	− 46.3	29.48	30.34
4	6 46 53.38	6.750	19 10 40.6	23.51	9.462 5133	+ 145.8	29.46	30.34
5	6 44 12.10	6.684	19 1 24.1	22.85	9.463 0928	336.8	29.42	30.30
6	6 41 32.90	−6.576	+18 52 24.4	−22.11	9.464 1284	+ 525.6	29.36	30.22
7	6 38 56.76	6.429	18 43 43.4	21.29	9.465 6133	711.0	29.27	30.12
8	6 36 24.60	6.245	18 35 22.9	20.40	9.467 5379	891.9	29.14	29.99
9	6 33 57.29	6.026	18 27 24.6	19.44	9.469 8902	1067.3	28.97	29.83
10	6 31 35.65	5.773	18 19 50.2	18.41	9.472 6559	1236.3	28.78	29.64
11	6 29 20.46	−5.489	+18 12 41.5	−17.31	9.475 8185	+1398.0	28.58	29.42
12	6 27 12.42	5.177	18 5 59.6	16.17	9.479 3599	1551.8	28.35	29.18
13	6 25 12.15	4.841	17 59 45.6	14.99	9.483 2604	1697.2	28.10	28.92
14	6 23 20.20	4.484	17 54 0.3	13.78	9.487 4991	1833.6	27.82	28.64
15	6 21 37.04	4.109	17 48 44.4	12.54	9.492 0541	1960.7	27.54	28.34
16	6 20 3.09	−3.718	+17 43 58.4	−11.28	9.496 9030	+2078.4	27.24	28.03
17	6 18 38.68	3.315	17 39 42.7	10.03	9.502 0228	2186.5	26.92	27.70
18	6 17 24.04	2.903	17 35 57.1	8.78	9.507 3906	2285.1	26.58	27.36
19	6 16 19.37	2.485	17 32 41.5	7.54	9.512 9838	2374.3	26.23	27.01
20	6 15 24.77	2.064	17 29 55.3	6.33	9.518 7801	2454.5	25.89	26.65
21	6 14 40.29	−1.642	+17 27 37.8	− 5.14	9.524 7582	+2525.9	25.54	26.29
22	6 14 5.94	1.221	17 25 48.3	3.99	9.530 8975	2588.9	25.18	25.92
23	6 13 41.67	0.803	17 24 25.9	2.89	9.537 1786	2644.0	24.82	25.54
24	6 13 27.37	−0.389	17 23 29.4	1.83	9.543 5830	2691.7	24.45	25.17
25	6 13 22.94	+0.019	17 22 57.7	− 0.82	9.550 0932	2732.3	24.09	24.80
26	6 13 28.21	+0.419	+17 22 49.5	+ 0.13	9.556 6931	+2766.5	23.73	24.42
27	6 13 43.01	0.812	17 23 3.3	1.02	9.563 3677	2794.6	23.37	24.05
28	6 14 7.15	1.198	17 23 37.7	1.84	9.570 1030	2817.2	23.00	23.68
29	6 14 40.41	1.574	17 24 31.1	2.60	9.576 8861	2834.6	22.64	23.31
30	6 15 22.59	1.940	17 25 42.1	3.30	9.583 7054	2847.4	22.29	22.95
31	6 16 13.44	+2.296	+17 27 8.9	+ 3.93	9.590 5501	+2855.8	21.95	22.59
Aug. 1	6 17 12.72	2.643	17 28 50.0	4.49	9.597 4103	2860.3	21.61	22.24
2	6 18 20.21	2.980	17 30 43.7	4.98	9.604 2770	2861.3	21.27	21.89
3	6 19 35.65	3.306	17 32 48.3	5.40	9.611 1421	2859.1	20.93	21.55
4	6 20 58.81	3.623	17 35 2.3	5.76	9.617 9984	2854.0	20.60	21.21
5	6 22 29.46	+3.930	+17 37 24.0	+ 6.05	9.624 8392	+2846.3	20.28	20.88
6	6 24 7.36	4.227	17 39 51.9	6.27	9.631 6587	2836.3	19.96	20.55
7	6 25 52.28	4.515	17 42 24.2	6.42	9.638 4516	2824.2	19.65	20.23
8	6 27 44.00	4.793	17 44 59.4	6.51	9.645 2131	2810.2	19.35	19.92
9	6 29 42.29	5.063	17 47 36.0	6.53	9.651 9391	2794.5	19.05	19.61
10	6 31 46.95	+5.324	+17 50 12.4	+ 6.49	9.658 6257	+2777.4	18.76	19.31
11	6 33 57.77	5.577	17 52 47.0	6.38	9.665 2694	2758.8	18.47	19.02
12	6 36 14.55	5.821	17 55 18.4	6.22	9.671 8670	2739.0	18.19	18.73
13	6 38 37.10	6.057	17 57 45.2	6.00	9.678 4156	2718.0	17.92	18.45
14	6 41 5.21	6.284	18 0 6.0	5.72	9.684 9127	2696.0	17.65	18.17
15	6 43 38.69	+6.504	+18 2 19.3	+ 5.38	9.691 3559	+2673.1	17.39	17.91
16	*6 46 17.36*	+6.716	+18 4 23.8	+ 4.99	9.697 7430	+2649.4	17.14	17.64

GREENWICH MEAN TIME.

Date.		Apparent Right Ascension. Noon.	Var. per Hour. Noon.	Apparent Declination. Noon.	Var. per Hour. Noon.	Logarithm of Distance from Earth. Noon.	Var. per Hour. Noon.	Semi-diameter. Noon.	Hor. Parallax. Noon.	Transit, Meridian of Greenwich.
		h m s	s	° ′ ″	″			″	″	h m
Aug.	16	6 46 17.36	+ 6.716	+18 4 23.8	+ 4.90	9.697 7430	+2649.4	17.14	17.64	21 7.0
	17	6 49 1.03	6.921	18 6 18.4	4.55	9.704 0723	2624.9	16.89	17.39	21 5.9
	18	6 51 49.52	7.118	18 8 1.8	4.05	9.710 3423	2599.9	16.65	17.14	21 4.8
	19	6 54 42.64	7.307	18 9 32.7	3.51	9.716 5516	2574.4	16.41	16.90	21 3.8
	20	6 57 40.21	7.489	18 10 50.1	2.93	9.722 6993	2548.6	16.18	16.66	21 2.9
	21	7 0 42.05	+ 7.664	+18 11 53.0	+ 2.31	9.728 7847	+2522.5	15.96	16.43	21 2.1
	22	7 3 48.01	7.832	18 12 40.4	1.64	9.734 8072	2496.2	15.74	16.20	21 1.3
	23	7 6 57.91	7.993	18 13 11.3	0.93	9.740 7663	2469.7	15.52	15.98	21 0.6
	24	7 10 11.59	8.147	18 13 24.6	+ 0.18	9.746 6618	2443.2	15.31	15.76	20 59.9
	25	7 13 28.91	8.295	18 13 19.6	− 0.60	9.752 4936	2416.7	15.11	15.55	20 59.3
	26	7 16 49.71	+ 8.437	+18 12 55.5	− 1.42	9.758 2619	+2390.3	14.91	15.35	20 58.7
	27	7 20 13.85	8.573	18 12 11.5	2.27	9.763 9668	2363.9	14.72	15.15	20 58.2
	28	7 23 41.19	8.704	18 11 6.9	3.14	9.769 6086	2337.7	14.53	14.96	20 57.8
	29	7 27 11.59	8.829	18 9 40.8	4.04	9.775 1877	2311.6	14.34	14.77	20 57.4
	30	7 30 44.92	8.948	18 7 52.7	4.97	9.780 7045	2285.8	14.16	14.58	20 57.1
	31	7 34 21.05	+ 9.062	+18 5 41.9	− 5.93	9.786 1596	+2260.2	13.98	14.40	20 56.8
ept.	1	7 37 59.86	9.171	18 3 7.8	6.92	9.791 5536	2234.8	13.81	14.22	20 56.5
	2	7 41 41.24	9.276	18 0 9.9	7.92	9.796 8871	2209.8	13.64	14.05	20 56.3
	3	7 45 25.07	9.376	17 56 47.7	8.94	9.802 1609	2185.1	13.47	13.88	20 56.1
	4	7 49 11.24	9.472	17 53 0.3	9.99	9.807 3757	2160.7	13.31	13.71	20 56.0
	5	7 52 59.65	+ 9.563	+17 48 48.2	−11.05	9.812 5323	+2136.5	13.15	13.55	20 55.9
	6	7 56 50.20	9.650	17 44 10.0	12.13	9.817 6313	2112.7	13.00	13.39	20 55.8
	7	8 0 42.79	9.732	17 39 5.7	13.23	9.822 6734	2089.1	12.85	13.24	20 55.8
	8	8 4 37.33	9.811	17 33 34.7	14.35	9.827 6594	2065.9	12.70	13.09	20 55.8
	9	8 8 33.73	9.887	17 27 36.9	15.48	9.832 5900	2042.9	12.56	12.94	20 55.8
	10	8 12 31.91	+ 9.960	+17 21 11.8	−16.62	9.837 4657	+2020.1	12.42	12.80	20 55.8
	11	8 16 31.79	10.029	17 14 19.1	17.77	9.842 2869	1997.6	12.28	12.66	20 55.9
	12	8 20 33.28	10.094	17 6 58.6	18.93	9.847 0542	1975.2	12.15	12.52	20 56.0
	13	8 24 36.29	10.156	16 59 10.1	20.10	9.851 7681	1953.0	12.02	12.39	20 56.1
	14	8 28 40.75	10.215	16 50 53.5	21.28	9.856 4290	1931.0	11.89	12.26	20 56.3
	15	8 32 46.58	+10.270	+16 42 8.6	−22.46	9.861 0374	+1909.3	11.77	12.13	20 56.5
	16	8 36 53.69	10.322	16 32 55.3	23.65	9.865 5937	1887.7	11.65	12.00	20 56.7
	17	8 41 2.02	10.371	16 23 13.6	24.83	9.870 0985	1866.3	11.53	11.87	20 56.9
	18	8 45 11.48	10.416	16 13 3.4	26.02	9.874 5524	1845.2	11.41	11.75	20 57.1
	19	8 49 22.00	10.459	16 2 24.7	27.21	9.878 9558	1824.3	11.30	11.63	20 57.3
	20	8 53 33.51	+10.499	+15 51 17.5	−28.39	9.883 3093	+1803.7	11.19	11.51	20 57.6
	21	8 57 45.95	10.536	15 39 42.1	29.56	9.887 6136	1783.3	11.08	11.40	20 57.9
	22	9 1 59.25	10.571	15 27 38.5	30.73	9.891 8692	1763.1	10.97	11.29	20 58.2
	23	9 6 13.34	10.603	15 15 6.8	31.90	9.896 0768	1743.2	10.86	11.18	20 58.5
	24	9 10 28.17	10.632	15 2 7.2	33.06	9.900 2370	1723.6	10.76	11.07	20 58.8
	25	9 14 43.67	+10.659	+14 48 39.9	−34.21	9.904 3505	+1704.3	10.66	10.97	20 59.1
	26	9 18 59.79	10.684	14 34 45.1	35.35	9.908 4180	1685.3	10.56	10.87	20 59.5
	27	9 23 16.48	10.707	14 20 23.0	36.48	9.912 4401	1666.5	10.46	10.77	20 59.9
	28	9 27 33.69	10.728	14 5 33.9	37.60	9.916 4175	1648.1	10.36	10.67	21 0.2
	29	9 31 51.38	10.746	13 50 18.1	38.71	9.920 3510	1629.9	10.27	10.57	21 0.5
	30	9 36 9.49	+10.763	+13 34 35.8	−39.81	9.924 2412	+1612.0	10.18	10.47	21 0.9
ct.	1	9 40 28.00	+10.779	+13 18 27.5	−40.89	9.928 0890	+1594.5	10.09	10.38	21 1.3

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h m
Oct. 1	9 40 28.00	+10.779	+13 18 27.5	−40.89	9.928 0890	+1594.5	10.09	10.38	21 1.3
2	9 44 46.86	10.793	13 1 53.4	41.95	9.931 8950	1577.3	10.00	10.29	21 1.6
3	9 49 6.04	10.805	12 44 53.8	43.01	9.935 6599	1560.3	9.91	10.20	21 2.0
4	9 53 25.51	10.816	12 27 29.0	44.05	9.939 3844	1543.5	9.82	10.11	21 2.4
5	9 57 45.25	10.827	12 9 39.5	45.07	9.943 0692	1527.1	9.74	10.03	21 2.8
6	10 2 5.22	+10.837	+11 51 25.6	−46.08	9.946 7149	+1511.0	9.66	9.95	21 3.2
7	10 6 25.42	10.846	11 32 47.7	47.07	9.950 3221	1495.1	9.58	9.87	21 3.6
8	10 10 45.81	10.854	11 13 46.2	48.05	9.953 8914	1479.4	9.50	9.79	21 4.0
9	10 15 6.39	10.861	10 54 21.5	49.01	9.957 4232	1463.9	9.42	9.71	21 4.4
10	10 19 27.14	10.868	10 34 34.0	49.95	9.960 9180	1448.5	9.34	9.63	21 4.8
11	10 23 48.05	+10.874	+10 14 24.1	−50.87	9.964 3761	+1433.3	9.27	9.55	21 5.2
12	10 28 9.10	10.880	9 53 52.4	51.77	9.967 7978	1418.2	9.20	9.48	21 5.6
13	10 32 30.30	10.886	9 32 59.3	52.65	9.971 1835	1403.3	9.13	9.40	21 6.0
14	10 36 51.63	10.891	9 11 45.3	53.51	9.974 5335	1388.5	9.06	9.33	21 6.4
15	10 41 13.08	10.896	8 50 11.1	54.34	9.977 8482	1373.8	8.99	9.26	21 6.8
16	10 45 34.63	+10.901	+ 8 28 17.1	−55.15	9.981 1279	+1359.3	8.92	9.19	21 7.3
17	10 49 56.29	10.905	8 6 3.8	55.94	9.984 3730	1344.9	8.86	9.12	21 7.7
18	10 54 18.05	10.909	7 43 31.9	56.71	9.987 5836	1330.6	8.79	9.05	21 8.1
19	10 58 39.92	10.913	7 20 42.0	57.45	9.990 7602	1316.6	8.73	8.98	21 8.5
20	11 3 1.89	10.917	6 57 34.6	58.16	9.993 9032	1302.6	8.67	8.92	21 9.0
21	11 7 23.95	+10.921	+ 6 34 10.4	−58.85	9.997 0129	+1288.8	8.61	8.86	21 9.4
22	11 11 46.10	10.925	6 10 30.0	59.51	0.000 0896	1275.2	8.55	8.80	21 9.8
23	11 16 8.36	10.929	5 46 34.0	60.15	0.003 1338	1261.7	8.49	8.74	21 10.2
24	11 20 30.72	10.934	5 22 23.1	60.76	0.006 1457	1248.3	8.43	8.68	21 10.7
25	11 24 53.19	10.939	4 57 57.9	61.34	0.009 1259	1235.2	8.37	8.62	21 11.1
26	11 29 15.79	+10.944	+ 4 33 19.0	−61.89	0.012 0746	+1222.1	8.31	8.56	21 11.5
27	11 33 38.51	10.949	4 8 27.2	62.42	0.014 9923	1209.3	8.26	8.50	21 11.9
28	11 38 1.37	10.955	3 43 23.1	62.92	0.017 8794	1196.7	8.20	8.44	21 12.4
29	11 42 24.37	10.962	3 18 7.4	63.39	0.020 7366	1184.3	8.14	8.38	21 12.9
30	11 46 47.53	10.969	2 52 40.7	63.83	0.023 5642	1172.1	8.09	8.33	21 13.3
31	11 51 10.87	+10.977	+ 2 27 3.8	−64.24	0.026 3626	+1160.0	8.04	8.28	21 13.7
Nov. 1	11 55 34.41	10.985	2 1 17.2	64.63	0.029 1323	1148.2	7.99	8.23	21 14.2
2	11 59 58.16	10.994	1 35 21.5	65.00	0.031 8738	1136.5	7.94	8.18	21 14.7
3	12 4 22.14	11.004	1 9 17.5	65.33	0.034 5875	1125.0	7.89	8.13	21 15.2
4	12 8 46.38	11.016	0 43 5.9	65.63	0.037 2739	1113.7	7.84	8.08	21 15.7
5	12 13 10.91	+11.028	+ 0 16 47.3	−65.91	0.039 9332	+1102.5	7.79	8.03	21 16.1
6	12 17 35.74	11.041	− 0 9 37.5	66.16	0.042 5657	1091.4	7.75	7.98	21 16.5
7	12 22 0.90	11.056	0 36 8.0	66.38	0.045 1719	1080.5	7.70	7.93	21 17.0
8	12 26 26.42	11.072	1 2 43.6	66.57	0.047 7520	1069.6	7.65	7.88	21 17.5
9	12 30 52.34	11.089	1 29 23.4	66.73	0.050 3062	1058.9	7.61	7.83	21 18.0
10	12 35 18.68	+11.107	− 1 56 6.7	−66.87	0.052 8348	+1048.3	7.57	7.79	21 18.5
11	12 39 45.46	11.125	2 22 52.9	66.97	0.055 3379	1037.7	7.53	7.75	21 19.0
12	12 44 12.70	11.145	2 49 41.2	67.04	0.057 8157	1027.1	7.48	7.70	21 19.5
13	12 48 40.43	11.166	3 16 30.8	67.08	0.060 2682	1016.7	7.44	7.65	21 20.1
14	12 53 8.69	11.189	3 43 21.1	67.10	0.062 6958	1006.3	7.40	7.61	21 20.7
15	12 57 37.50	+11.213	− 4 10 11.3	−67.08	0.065 0985	+ 996.0	7.36	7.57	21 21.2
16	*13 2 6.90*	*+11.237*	− 4 37 0.6	−67.03	0.067 4767	+ 985.8	7.32	7.53	21 21.7

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″			″	″	h m
Nov. 16	13 2 6.90	+11.237	− 4 37 0.6	−67.03	0.067 4767	+985.8	7.32	7.53	21 21.7
17	13 6 36.90	11.263	5 3 48.2	66.94	0.069 8304	975.7	7.28	7.49	21 22.3
18	13 11 7.53	11.290	5 30 33.5	66.82	0.072 1600	965.6	7.24	7.45	21 22.9
19	13 15 38.81	11.318	5 57 15.6	66.67	0.074 4655	955.7	7.20	7.41	21 23.5
20	13 20 10.78	11.347	6 23 53.7	66.49	0.076 7472	945.8	7.16	7.37	21 24.1
21	13 24 43.46	+11.377	− 6 50 27.1	−66.28	0.079 0052	+935.9	7.13	7.33	21 24.7
22	13 29 16.87	11.408	7 16 55.0	66.04	0.081 2396	926.2	7.09	7.29	21 25.3
23	13 33 51.04	11.440	7 43 16.6	65.76	0.083 4508	916.5	7.05	7.25	21 25.9
24	13 38 25.99	11.473	8 9 31.1	65.45	0.085 6389	907.0	7.01	7.21	21 26.6
25	13 43 1.75	11.507	8 35 37.7	65.10	0.087 8042	897.5	6.98	7.18	21 27.3
26	13 47 38.34	+11.542	− 9 1 35.6	−64.72	0.089 9471	+888.2	6.95	7.15	21 28.0
27	13 52 15.78	11.578	9 27 24.0	64.31	0.092 0678	879.0	6.91	7.11	21 28.7
28	13 56 54.10	11.615	9 53 2.1	63.86	0.094 1666	870.0	6.87	7.08	21 29.4
29	14 1 33.32	11.653	10 18 29.1	63.38	0.096 2438	861.1	6.84	7.05	21 30.1
30	14 6 13.46	11.692	10 43 44.4	62.87	0.098 2998	852.3	6.81	7.02	21 30.8
Dec. 1	14 10 54.55	+11.732	−11 8 47.0	−62.33	0.100 3350	+843.7	6.78	6.99	21 31.6
2	14 15 36.62	11.773	11 33 36.2	61.76	0.102 3496	835.2	6.75	6.95	21 32.4
3	14 20 19.68	11.815	11 58 11.3	61.15	0.104 3438	826.7	6.72	6.92	21 33.1
4	14 25 3.76	11.858	12 22 31.4	60.51	0.106 3179	818.4	6.69	6.89	21 33.9
5	14 29 48.89	11.902	12 46 35.7	59.84	0.108 2722	810.2	6.66	6.86	21 34.8
6	14 34 35.08	+11.947	−13 10 23.5	−59.14	0.110 2070	+802.1	6.63	6.83	21 35.7
7	14 39 22.36	11.993	13 33 54.0	58.40	0.112 1223	794.0	6.60	6.80	21 36.5
8	14 44 10.75	12.040	13 57 6.4	57.63	0.114 0183	786.0	6.57	6.77	21 37.3
9	14 49 0.26	12.087	14 19 59.9	56.82	0.115 8952	778.1	6.54	6.74	21 38.2
10	14 53 50.92	12.135	14 42 33.7	55.98	0.117 7532	770.2	6.51	6.71	21 39.1
11	14 58 42.74	+12.183	−15 4 46.9	−55.11	0.119 5923	+762.4	6.49	6.68	21 40.1
12	15 3 35.72	12.232	15 26 38.9	54.21	0.121 4126	754.6	6.46	6.65	21 41.1
13	15 8 29.88	12.281	15 48 8.8	53.27	0.123 2143	746.8	6.43	6.62	21 42.0
14	15 13 25.24	12.331	16 9 15.9	52.30	0.124 9975	739.2	6.40	6.59	21 43.0
15	15 18 21.79	12.381	16 29 59.2	51.30	0.126 7623	731.5	6.38	6.57	21 44.0
16	15 23 19.54	+12.431	−16 50 18.1	−50.27	0.128 5088	+723.9	6.36	6.55	21 45.0
17	15 28 18.49	12.481	17 10 11.7	49.20	0.130 2370	716.3	6.33	6.52	21 46.1
18	15 33 18.64	12.531	17 29 39.3	48.10	0.131 9471	708.8	6.30	6.49	21 47.2
19	15 38 19.99	12.581	17 48 40.1	46.97	0.133 6391	701.3	6.28	6.46	21 48.3
20	15 43 22.53	12.631	18 7 13.3	45.80	0.135 3132	693.8	6.26	6.44	21 49.4
21	15 48 26.26	+12.680	−18 25 18.2	−44.60	0.136 9694	+686.4	6.24	6.42	21 50.6
22	15 53 31.17	12.729	18 42 54.0	43.37	0.138 6079	679.0	6.21	6.39	21 51.8
23	15 58 37.23	12.777	19 0 0.0	42.12	0.140 2288	671.8	6.18	6.36	21 52.9
24	16 3 44.44	12.824	19 16 35.5	40.83	0.141 8323	664.5	6.16	6.34	21 54.1
25	16 8 52.78	12.870	19 32 39.7	39.51	0.143 4186	657.4	6.14	6.32	21 55.3
26	16 14 2.22	+12.916	−19 48 12.0	−38.17	0.144 9879	+650.3	6.12	6.30	21 56.5
27	16 19 12.74	12.961	20 3 11.7	36.80	0.146 5403	643.4	6.09	6.27	21 57.8
28	16 24 24.33	13.005	20 17 38.2	35.40	0.148 0762	636.6	6.07	6.25	21 59.1
29	16 29 36.95	13.047	20 31 30.7	33.98	0.149 5957	629.8	6.05	6.23	22 0.4
30	16 34 50.58	13.088	20 44 48.8	32.53	0.151 0992	623.1	6.03	6.21	22 1.7
31	16 40 5.19	+13.128	−20 57 31.8	−31.05	0.152 5868	+616.6	6.01	6.19	22 3.0
32	16 45 20.74	+13.167	−21 9 39.0	−29.55	0.154 0588	+610.2	5.99	6.17	22 4.3

FOR GREENWICH MEAN NOON.

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		° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″		
Jan.	1	345 23 20.2	1 35 14.4	+0 3.4	−3 23 37.3	−0 3.2	9.861 7336	−473
	3	348 33 51.5	1 35 16.9	−0 16.6	3 23 24.9	+0 15.6	9.861 6353	509
	5	351 44 28.0	1 35 19.5	0 36.5	3 22 35.1	0 34.3	9.861 5300	544
	7	354 55 9.8	1 35 22.2	0 55.9	3 21 7.9	0 52.9	9.861 4178	577
	9	358 5 57.0	1 35 25.0	1 14.6	3 19 3.6	1 11.4	9.861 2992	609
	11	1 16 49.7	1 35 27.8	−1 32.4	−3 16 22.6	+1 29.7	9.861 1744	−639
	13	4 27 48.0	1 35 30.6	1 49.1	3 13 5.2	1 47.7	9.861 0438	666
	15	7 38 52.0	1 35 33.4	2 4.4	3 9 12.0	2 5.4	9.860 9079	692
	17	10 50 1.7	1 35 36.3	2 18.2	3 4 43.6	2 22.8	9.860 7671	715
	19	14 1 17.3	1 35 39.3	2 30.3	2 59 40.8	2 39.8	9.860 6218	737
	21	17 12 38.8	1 35 42.3	−2 40.6	−2 54 4.5	+2 56.4	9.860 4723	−757
	23	20 24 6.3	1 35 45.3	2 48.9	2 47 55.6	3 12.4	9.860 3192	774
	25	23 35 39.9	1 35 48.4	2 55.1	2 41 15.2	3 27.9	9.860 1630	788
	27	26 47 19.8	1 35 51.5	2 59.1	2 34 4.5	3 42.7	9.860 0041	800
	29	29 59 5.9	1 35 54.6	3 0.9	2 26 24.8	3 56.9	9.859 8430	810
	31	33 10 58.2	1 35 57.8	−3 0.5	−2 18 17.5	+4 10.4	9.859 6802	−817
Feb.	2	36 22 57.0	1 36 1.0	2 57.8	2 9 43.9	4 23.1	9.859 5163	822
	4	39 35 2.3	1 36 4.3	2 52.9	2 0 45.7	4 35.0	9.859 3516	824
	6	42 47 14.2	1 36 7.6	2 45.8	1 51 24.4	4 46.1	9.859 1867	824
	8	45 59 32.7	1 36 10.9	2 36.6	1 41 41.8	4 56.3	9.859 0222	821
	10	49 11 58.0	1 36 14.3	−2 25.5	−1 31 39.7	+5 5.6	9.858 8586	−815
	12	52 24 30.2	1 36 17.8	2 12.5	1 21 19.9	5 14.0	9.858 6963	807
	14	55 37 9.3	1 36 21.3	1 57.9	1 10 44.3	5 21.4	9.858 5359	796
	16	58 49 55.3	1 36 24.8	1 41.8	0 59 55.0	5 27.8	9.858 3779	783
	18	62 2 48.4	1 36 28.3	1 24.4	0 48 53.9	5 33.2	9.858 2227	768
	20	65 15 48.7	1 36 31.9	−1 5.9	−0 37 43.0	+5 37.5	9.858 0710	−749
	22	68 28 56.1	1 36 35.5	0 46.5	0 26 24.6	5 40.7	9.857 9232	729
	24	71 42 10.7	1 36 39.1	0 26.6	0 15 0.7	5 42.9	9.857 7796	706
	26	74 55 32.5	1 36 42.7	−0 6.3	−0 3 33.5	5 44.1	9.857 6408	681
	28	78 9 1.5	1 36 46.3	+0 14.1	+0 7 54.9	5 44.1	9.857 5074	653
Mar.	1	81 22 37.7	1 36 49.9	+0 34.3	+0 19 22.1	+5 42.9	9.857 3797	−624
	3	84 36 20.9	1 36 53.4	0 54.1	0 30 46.0	5 40.7	9.857 2580	593
	5	87 50 11.2	1 36 56.9	1 13.2	0 42 4.4	5 37.5	9.857 1428	559
	7	91 4 8.4	1 37 0.3	1 31.4	0 53 15.2	5 33.1	9.857 0345	524
	9	94 18 12.4	1 37 3.6	1 48.4	1 4 16.1	5 27.6	9.856 9334	487
	11	97 32 23.0	1 37 6.9	+2 4.1	+1 15 5.0	+5 21.1	9.856 8398	−449
	13	100 46 40.0	1 37 10.0	2 18.1	1 25 39.8	5 13.5	9.856 7541	408
	15	104 1 3.1	1 37 13.0	2 30.5	1 35 58.4	5 4.9	9.856 6766	367
	17	107 15 32.1	1 37 15.9	2 40.9	1 45 58.8	4 55.3	9.856 6075	324
	19	110 30 6.6	1 37 18.6	2 49.2	1 55 39.1	4 44.8	9.856 5470	281
	21	113 44 46.3	1 37 21.1	+2 55.4	+2 4 57.3	+4 33.3	9.856 4953	−236
	23	116 59 30.9	1 37 23.4	2 59.4	2 13 51.6	4 20.9	9.856 4526	191
	25	120 14 19.8	1 37 25.4	3 1.0	2 22 20.2	4 7.6	9.856 4191	145
	27	123 29 12.5	1 37 27.2	3 0.3	2 30 21.5	3 53.5	9.856 3948	98
	29	126 44 8.6	1 37 28.8	2 57.3	2 37 53.9	3 38.7	9.856 3798	52
	31	129 59 7.6	1 37 30.1	+2 52.0	+2 44 55.9	+3 23.2	9.856 3742	− 4
Apr.	2	133 14 8.8	1 37 31.0	+2 44.5	+2 51 26.1	+3 6.9	9.856 3781	+ 43

FOR GREENWICH MEAN NOON.

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		° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″		
pr.	2	133 14 8.8	1 37 31.0	+2 44.5	+2 51 26.1	+3 6.9	9.856 3781	+ 43
	4	136 29 11.6	1 37 31.7	2 34.9	2 57 23.2	2 50.1	9.856 3914	90
	6	139 44 15.5	1 37 32.1	2 23.3	3 2 46.1	2 32.7	9.856 4140	136
	8	142 59 19.8	1 37 32.1	2 9.9	3 7 33.8	2 14.9	9.856 4459	182
	10	146 14 23.8	1 37 31.8	1 54.8	3 11 45.3	1 56.5	9.856 4869	228
	12	149 29 26.8	1 37 31.1	+1 38.2	+3 15 19.7	+1 37.8	9.856 5370	+273
	14	152 44 28.1	1 37 30.1	1 20.4	3 18 16.5	1 18.9	9.856 5959	317
	16	155 59 27.1	1 37 28.7	1 1.5	3 20 35.1	0 59.6	9.856 6636	360
	18	159 14 23.0	1 37 27.0	0 41.8	3 22 15.0	0 40.2	9.856 7397	401
	20	162 29 15.1	1 37 24.9	0 21.7	3 23 15.9	0 20.7	9.856 8240	442
	22	165 44 2.7	1 37 22.5	+0 1.3	+3 23 37.8	+0 1.2	9.856 9163	+481
	24	168 58 45.2	1 37 19.8	−0 19.2	3 23 20.6	−0 18.4	9.857 0162	518
	26	172 13 21.8	1 37 16.8	0 39.4	3 22 24.4	0 37.8	9.857 1234	553
	28	175 27 52.0	1 37 13.4	0 59.1	3 20 49.4	0 57.1	9.857 2375	587
	30	178 42 15.2	1 37 9.7	1 18.0	3 18 36.0	1 16.2	9.857 3582	619
ay	2	181 56 30.7	1 37 5.7	−1 35.9	+3 15 44.8	−1 34.9	9.857 4851	+649
	4	185 10 38.0	1 37 1.5	1 52.6	3 12 16.3	1 53.4	9.857 6178	677
	6	188 24 36.6	1 36 57.1	2 7.8	3 8 11.2	2 11.5	9.857 7559	703
	8	191 38 26.1	1 36 52.4	2 21.4	3 3 30.4	2 29.1	9.857 8988	726
	10	194 52 6.0	1 36 47.5	2 33.2	2 58 15.0	2 46.2	9.858 0462	747
	12	198 5 36.0	1 36 42.4	−2 43.1	+2 52 26.0	−3 2.7	9.858 1976	+766
	14	201 18 55.7	1 36 37.2	2 50.9	2 46 4.6	3 18.6	9.858 3524	782
	16	204 32 4.9	1 36 31.9	2 56.5	2 39 12.0	3 33.9	9.858 5102	796
	18	207 45 3.4	1 36 26.5	2 59.9	2 31 49.6	3 48.4	9.858 6705	807
	20	210 57 51.1	1 36 21.1	3 1.0	2 23 58.9	4 2.1	9.858 8328	816
	22	214 10 27.8	1 36 15.6	−2 59.9	+2 15 41.5	−4 15.1	9.858 9966	+822
	24	217 22 53.5	1 36 10.1	2 56.5	2 6 59.0	4 27.2	9.859 1613	825
	26	220 35 8.2	1 36 4.6	2 50.9	1 57 53.1	4 38.5	9.859 3264	826
	28	223 47 12.1	1 35 59.2	2 43.2	1 48 25.5	4 48.9	9.859 4915	824
	30	226 59 5.2	1 35 53.9	2 33.4	1 38 38.1	4 58.4	9.859 6560	820
ne	1	230 10 47.7	1 35 48.6	−2 21.7	+1 28 32.7	−5 6.9	9.859 8193	+813
	3	233 22 19.8	1 35 43.5	2 8.3	1 18 11.3	5 14.4	9.859 9810	804
	5	236 33 41.8	1 35 38.5	1 53.3	1 7 35.8	5 20.9	9.860 1407	792
	7	239 44 54.0	1 35 33.7	1 37.0	0 56 48.3	5 26.4	9.860 2978	778
	9	242 55 56.8	1 35 29.1	1 19.4	0 45 50.7	5 31.0	9.860 4517	761
	11	246 6 50.6	1 35 24.7	−1 0.9	+0 34 45.0	−5 34.5	9.860 6021	+742
	13	249 17 35.9	1 35 20.6	0 41.6	0 23 33.4	5 37.0	9.860 7485	721
	15	252 28 13.1	1 35 16.7	0 21.8	0 12 17.9	5 38.4	9.860 8905	698
	17	255 38 42.6	1 35 13.0	−0 1.8	+0 1 0.5	5 38.8	9.861 0276	672
	19	258 49 5.1	1 35 9.6	+0 18.2	−0 10 16.6	5 38.2	9.861 1593	645
	21	261 59 21.0	1 35 6.5	+0 38.0	−0 21 31.4	−5 36.5	9.861 2854	+616
	23	265 9 30.9	1 35 3.6	0 57.4	0 32 41.9	5 33.8	9.861 4055	585
	25	268 19 35.3	1 35 1.0	1 16.0	0 43 46.0	5 30.1	9.861 5191	551
	27	271 29 34.9	1 34 58.7	1 33.7	0 54 41.8	5 25.4	9.861 6259	517
	29	274 39 30.2	1 34 56.7	1 50.2	1 5 27.3	5 19.8	9.861 7257	481
ly	1	277 49 21.8	1 34 55.0	+2 5.4	−1 16 0.5	−5 13.2	9.861 8181	+443
	3	280 59 10.3	1 34 53.6	+2 19.0	−1 26 19.5	−5 5.6	9.861 9028	+404

FOR GREENWICH MEAN NOON.

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		° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″		
July	1	277 49 21.8	1 34 55.0	+2 5.4	−1 16 0.5	−5 13.2	9.861 8181	+443
	3	280 59 10.3	1 34 53.6	2 19.0	1 26 19.5	5 5.6	9.861 9028	404
	5	284 8 56.3	1 34 52.5	2 30.9	1 36 22.5	4 57.2	9.861 9796	364
	7	287 18 40.3	1 34 51.6	2 41.0	1 46 7.8	4 47.9	9.862 0483	323
	9	290 28 22.8	1 34 51.0	2 49.2	1 55 33.5	4 37.7	9.862 1087	281
	11	293 38 4.4	1 34 50.7	+2 55.2	−2 4 37.9	−4 26.6	9.862 1605	+238
	13	296 47 45.7	1 34 50.7	2 59.2	2 13 19.5	4 14.8	9.862 2037	194
	15	299 57 27.2	1 34 50.9	3 0.9	2 21 36.7	4 2.2	9.862 2381	150
	17	303 7 9.3	1 34 51.3	3 0.5	2 29 28.0	3 48.9	9.862 2636	105
	19	306 16 52.4	1 34 51.9	2 57.8	2 36 51.9	3 34.9	9.862 2801	60
	21	309 26 37.1	1 34 52.8	+2 53.0	−2 43 47.2	−3 20.3	9.862 2876	+ 15
	23	312 36 23.7	1 34 53.9	2 46.1	2 50 12.6	3 5.1	9.862 2860	− 30
	25	315 46 12.7	1 34 55.2	2 37.2	2 56 7.0	2 49.3	9.862 2754	76
	27	318 56 4.4	1 34 56.6	2 26.4	3 1 29.2	2 32.9	9.862 2557	121
	29	322 5 59.1	1 34 58.2	2 13.7	3 6 18.3	2 16.1	9.862 2271	165
	31	325 15 57.2	1 35 0.0	+1 59.5	−3 10 33.4	−1 58.9	9.862 1896	−209
Aug.	2	328 25 59.0	1 35 1.9	1 43.7	3 14 13.7	1 41.3	9.862 1434	253
	4	331 36 4.7	1 35 3.9	1 26.7	3 17 18.5	1 23.4	9.862 0885	296
	6	334 46 14.5	1 35 6.0	1 8.7	3 19 47.2	1 5.2	9.862 0252	339
	8	337 56 28.7	1 35 8.2	0 49.8	3 21 39.4	0 46.8	9.861 9535	379
	10	341 6 47.5	1 35 10.6	+0 30.3	−3 22 54.7	−0 28.3	9.861 8737	−418
	12	344 17 11.1	1 35 13.0	+0 10.4	3 23 32.7	−0 9.7	9.861 7862	457
	14	347 27 39.6	1 35 15.5	−0 9.7	3 23 33.3	+0 9.0	9.861 6910	494
	16	350 38 13.2	1 35 18.1	0 29.6	3 22 56.5	0 27.7	9.861 5885	530
	18	353 48 52.0	1 35 20.7	0 49.2	3 21 42.4	0 46.4	9.861 4790	564
	20	356 59 36.2	1 35 23.4	−1 8.1	−3 19 51.1	+1 4.9	9.861 3629	−596
	22	0 10 25.8	1 35 26.2	1 26.3	3 17 22.8	1 23.3	9.861 2405	627
	24	3 21 20.9	1 35 29.0	1 43.4	3 14 18.1	1 41.4	9.861 1121	656
	26	6 32 21.7	1 35 31.8	1 59.2	3 10 37.4	1 59.2	9.860 9781	683
	28	9 43 28.3	1 35 34.7	2 18.6	3 6 21.3	2 16.8	9.860 8390	707
	30	12 54 40.7	1 35 37.6	−2 26.3	−3 1 30.4	+2 34.0	9.860 6952	−730
Sept.	1	16 5 59.0	1 35 40.6	2 37.2	2 56 5.7	2 50.7	9.860 5470	751
	3	19 17 23.3	1 35 43.6	2 46.2	2 50 8.1	3 6.8	9.860 3950	769
	5	22 28 53.6	1 35 46.7	2 53.2	2 43 38.7	3 22.4	9.860 2396	785
	7	25 40 30.1	1 35 49.8	2 58.0	2 36 38.6	3 37.5	9.860 0813	798
	9	28 52 12.8	1 35 52.9	−3 0.6	−2 29 9.0	+3 51.9	9.859 9206	−809
	11	32 4 1.9	1 35 56.1	3 0.9	2 21 11.2	4 5.7	9.859 7579	817
	13	35 15 57.4	1 35 59.4	2 59.0	2 12 46.7	4 18.7	9.859 5938	823
	15	38 27 59.4	1 36 2.7	2 54.8	2 3 57.0	4 30.9	9.859 4288	827
	17	41 40 8.0	1 36 6.0	2 48.5	1 54 43.6	4 42.3	9.859 2633	827
	19	44 52 23.2	1 36 9.3	−2 40.1	−1 45 8.4	+4 52.8	9.859 0980	−825
	21	48 4 45.2	1 36 12.7	2 29.6	1 35 13.0	5 2.5	9.858 9333	821
	23	51 17 14.0	1 36 16.1	2 17.3	1 24 59.2	5 11.2	9.858 7698	814
	25	54 29 49.8	1 36 19.6	2 3.2	1 14 29.0	5 18.9	9.858 6079	804
	27	57 42 32.6	1 36 23.1	1 47.6	1 3 44.3	5 25.7	9.858 4482	792
	29	60 55 22.5	1 36 26.7	−1 30.7	−0 52 47.1	+5 31.4	9.858 2912	−777
Oct.	1	64 8 19.5	1 36 30.3	−1 12.5	−0 41 39.5	+5 36.0	9.858 1373	−760

FOR GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″		
ct. 1	64 8 19.5	1 36 30.3	−1 12.5	−0 41 39.5	+5 36.0	9.858 1373	−760
3	67 21 23.7	1 36 33.9	0 53.4	0 30 23.6	5 39.7	9.857 9871	741
5	70 34 35.1	1 36 37.5	0 33.7	0 19 1.4	5 42.3	9.857 8411	719
7	73 47 53.8	1 36 41.2	−0 13.5	−0 7 35.1	5 43.8	9.857 6997	695
9	77 1 19.8	1 36 44.8	+0 6.9	+0 3 53.1	5 44.2	9.857 5633	669
11	80 14 53.0	1 36 48.4	+0 27.2	+0 15 20.9	+5 43.5	9.857 4324	−640
13	83 28 33.3	1 36 52.0	0 47.2	0 26 46.2	5 41.6	9.857 3075	609
15	86 42 20.8	1 36 55.5	1 6.6	0 38 6.7	5 38.7	9.857 1889	577
17	89 56 15.3	1 36 59.0	1 25.1	0 49 20.4	5 34.8	9.857 0770	542
19	93 10 16.7	1 37 2.4	1 42.6	1 0 25.0	5 29.7	9.856 9722	505
21	96 24 24.8	1 37 5.7	+1 58.7	+1 11 18.4	+5 23.5	9.856 8749	−467
23	99 38 39.4	1 37 8.9	2 13.4	1 21 58.4	5 16.3	9.856 7853	428
25	102 53 0.3	1 37 12.0	2 26.4	1 32 22.9	5 8.0	9.856 7037	387
27	106 7 27.3	1 37 14.9	2 37.5	1 42 29.9	4 58.8	9.856 6305	345
29	109 22 0.0	1 37 17.7	2 46.5	1 52 17.5	4 48.6	9.856 5657	302
31	112 36 38.1	1 37 20.3	+2 53.5	+2 1 43.6	+4 37.4	9.856 5098	−257
ov. 2	115 51 21.1	1 37 22.7	2 58.2	2 10 46.5	4 25.3	9.856 4628	212
4	119 6 8.7	1 37 24.9	3 0.7	2 19 24.4	4 12.4	9.856 4249	166
6	122 21 0.5	1 37 26.8	3 0.8	2 27 35.5	3 58.6	9.856 3963	120
8	125 35 55.9	1 37 28.5	2 58.6	2 35 18.2	3 44.0	9.856 3770	72
10	128 50 54.3	1 37 29.9	+2 54.1	+2 42 31.0	+3 28.7	9.856 3671	− 26
12	132 5 55.2	1 37 31.0	2 47.4	2 49 12.6	3 12.7	9.856 3666	+ 21
14	135 20 58.1	1 37 31.8	2 38.5	2 55 21.5	2 56.1	9.856 3755	68
16	138 36 2.3	1 37 32.3	2 27.6	3 0 56.6	2 38.9	9.856 3938	115
18	141 51 7.1	1 37 32.4	2 14.8	3 5 56.7	2 21.2	9.856 4215	162
20	145 6 11.9	1 37 32.2	+2 0.2	+3 10 21.0	+2 3.0	9.856 4584	+208
22	148 21 16.0	1 37 31.7	1 44.2	3 14 8.6	1 44.4	9.856 5045	253
24	151 36 18.8	1 37 30.9	1 26.7	3 17 18.7	1 25.5	9.856 5595	297
26	154 51 19.5	1 37 29.7	1 8.2	3 19 50.7	1 6.4	9.856 6233	341
28	158 6 17.4	1 37 28.1	0 48.8	3 21 44.2	0 47.1	9.856 6957	383
30	161 21 11.8	1 37 26.2	+0 28.8	+3 22 58.9	+0 27.6	9.856 7765	+424
Dec. 2	164 36 2.0	1 37 23.9	+0 8.4	3 23 34.5	+0 8.0	9.856 8653	464
4	167 50 47.3	1 37 21.3	−0 12.1	3 23 31.0	−0 11.5	9.856 9619	502
6	171 5 27.0	1 37 18.4	0 32.4	3 22 48.4	0 31.0	9.857 0660	539
8	174 20 0.6	1 37 15.1	0 52.3	3 21 27.0	0 50.3	9.857 1772	573
10	177 34 27.3	1 37 11.5	−1 11.5	+3 19 27.1	−1 9.5	9.857 2952	+606
12	180 48 46.6	1 37 7.7	1 29.8	3 16 49.0	1 28.5	9.857 4196	637
14	184 2 57.9	1 37 3.6	1 46.9	3 13 33.4	1 47.1	9.857 5500	666
16	187 17 0.7	1 36 59.2	2 2.7	3 9 41.0	2 5.3	9.857 6859	693
18	190 30 54.6	1 36 54.6	2 16.9	3 5 12.6	2 23.0	9.857 8270	717
20	193 44 39.0	1 36 49.8	−2 29.3	+3 0 9.2	−2 40.3	9.857 9727	+739
22	196 58 13.6	1 36 44.8	2 39.9	2 54 31.8	2 57.0	9.858 1226	759
24	200 11 38.1	1 36 39.6	2 48.4	2 48 21.5	3 13.1	9.858 2762	777
26	203 24 52.2	1 36 34.4	2 54.8	2 41 39.6	3 28.6	9.858 4331	792
28	206 37 55.6	1 36 29.0	2 59.0	2 34 27.5	3 43.4	9.858 5927	804
30	209 50 48.2	1 36 23.6	−3 0.9	+2 26 46.5	−3 57.4	9.858 7545	+814
32	213 3 29.8	1 36 18 1	−3 0.5	+2 18 38.2	−4 10.7	9.858 9181	+821

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″			″	″	h m
Jan. 1	10 12 48.01	+0.073	+14 50 16.4	+ 5.86	9.916 9873	−1501.2	6.11	10.65	15 31.0
2	10 12 48.23	−0.054	14 52 45.3	6.55	9.913 3960	1491.4	6.16	10.74	15 27.0
3	10 12 45.41	0.182	14 55 30.9	7.25	9.909 8299	1480.2	6.22	10.83	15 23.0
4	10 12 39.50	0.311	14 58 33.3	7.95	9.906 2920	1467.7	6.27	10.92	15 18.9
5	10 12 30.48	0.441	15 1 52.3	8.64	9.902 7859	1453.8	6.32	11.00	15 14.8
6	10 12 18.32	−0.572	+15 5 28.0	+ 9.33	9.899 3150	−1438.4	6.37	11.09	15 10.7
7	10 12 3.01	0.704	15 9 20.1	10.01	9.895 8828	1421.5	6.42	11.18	15 6.4
8	10 11 44.53	0.836	15 13 28.7	10.70	9.892 4931	1403.1	6.47	11.27	15 2.2
9	10 11 22.87	0.969	15 17 53.4	11.37	9.889 1493	1383.2	6.51	11.35	14 57.9
10	10 10 58.03	1.101	15 22 34.2	12.03	9.885 8550	1361.8	6.57	11.44	14 53.5
11	10 10 30.00	−1.234	+15 27 30.7	+12.68	9.882 6139	−1338.8	6.62	11.53	14 49.0
12	10 9 58.78	1.367	15 32 42.7	13.32	9.879 4298	1314.3	6.67	11.62	14 44.6
13	10 9 24.39	1.499	15 38 9.8	13.94	9.876 3064	1288.2	6.72	11.70	14 40.0
14	10 8 46.82	1.631	15 43 51.6	14.55	9.873 2477	1260.5	6.76	11.78	14 35.5
15	10 8 6.09	1.763	15 49 47.8	15.14	9.870 2575	1231.1	6.81	11.86	14 30.8
16	10 7 22.22	−1.893	+15 55 57.9	+15.70	9.867 3397	−1200.1	6.86	11.95	14 26.1
17	10 6 35.24	2.022	16 2 21.4	16.25	9.864 4984	1167.4	6.91	12.03	14 21.4
18	10 5 45.17	2.150	16 8 57.9	16.78	9.861 7376	1133.0	6.95	12.11	14 16.6
19	10 4 52.04	2.277	16 15 46.7	17.28	9.859 0615	1096.9	6.99	12.18	14 11.8
20	10 3 55.90	2.401	16 22 47.3	17.76	9.856 4740	1059.1	7.03	12.25	14 6.9
21	10 2 56.79	−2.524	+16 29 59.1	+18.21	9.853 9793	−1019.6	7.07	12.32	14 1.9
22	10 1 54.78	2.644	16 37 21.4	18.64	9.851 5815	978.4	7.11	12.39	13 56.9
23	10 0 49.91	2.761	16 44 53.4	19.02	9.849 2846	935.5	7.15	12.46	13 51.9
24	9 59 42.26	2.876	16 52 34.4	19.38	9.847 0925	890.9	7.19	12.52	13 46.8
25	9 58 31.91	2.986	17 0 23.6	19.71	9.845 0095	844.6	7.22	12.58	13 41.7
26	9 57 18.94	−3.093	+17 8 20.2	+20.00	9.843 0396	− 796.7	7.25	12.64	13 36.5
27	9 56 3.44	3.197	17 16 23.1	20.24	9.841 1866	747.2	7.28	12.69	13 31.3
28	9 54 45.51	3.296	17 24 31.5	20.45	9.839 4544	696.0	7.31	12.74	13 26.1
29	9 53 25.27	3.390	17 32 44.4	20.62	9.837 8468	643.4	7.34	12.79	13 20.8
30	9 52 2.84	3.479	17 41 0.8	20.74	9.836 3672	589.4	7.36	12.83	13 15.5
31	9 50 38.35	−3.561	+17 49 19.5	+20.82	9.835 0189	− 534.0	7.39	12.87	13 10.1
Feb. 1	9 49 11.95	3.638	17 57 39.6	20.85	9.833 8051	477.3	7.41	12.91	13 4.8
2	9 47 43.79	3.708	18 5 59.8	20.83	9.832 7287	419.5	7.43	12.94	12 59.3
3	9 46 14.03	3.771	18 14 19.1	20.77	9.831 7921	360.8	7.44	12.97	12 53.9
4	9 44 42.85	3.827	18 22 36.3	20.66	9.830 9974	301.2	7.46	12.99	12 48.5
5	9 43 10.41	−3.875	+18 30 50.3	+20.50	9.830 3470	− 240.8	7.47	13.01	12 43.0
6	9 41 36.90	3.916	18 39 0.0	20.30	9.829 8418	180.1	7.48	13.03	12 37.5
7	9 40 2.50	3.949	18 47 4.2	20.05	9.829 4829	119.0	7.48	13.03	12 32.0
8	9 38 27.40	3.974	18 55 2.0	19.76	9.829 2709	− 57.6	7.48	13.03	12 26.5
9	9 36 51.79	3.992	19 2 52.2	19.42	9.829 2063	+ 3.8	7.48	13.04	12 21.0
10	9 35 15.85	−4.001	+19 10 34.0	+19.05	9.829 2889	+ 65.1	7.48	13.04	12 15.5
11	9 33 39.78	4.003	19 18 6.3	18.64	9.829 5185	126.2	7.48	13.03	12 9.9
12	9 32 3.76	3.997	19 25 28.4	18.20	9.829 8944	187.0	7.47	13.02	12 4.4
13	9 30 27.99	3.983	19 32 39.4	17.72	9.830 4157	247.3	7.47	13.01	11 58.9
14	9 28 52.64	3.961	19 39 38.6	17.21	9.831 0809	307.0	7.46	12.99	11 53.4
15	9 27 17.90	−3.932	+19 46 25.3	+16.67	9.831 8885	+ 365.9	7.44	12.96	11 47.9
16	9 25 43.94	−3.896	+19 52 58.8	+16.11	9.832 8367	+ 424.1	7.42	12.93	11 42.4

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h m
b. 16	9 25 43.94	−3.896	+19 52 58.8	+16.11	9.832 8367	+ 424.1	7.42	12.93	11 42.4
17	9 24 10.94	3.853	19 59 18.6	15.53	9.833 9234	481.3	7.40	12.90	11 37.0
18	9 22 39.07	3.802	20 5 24.1	14.92	9.835 1462	537.5	7.38	12.86	11 31.5
19	9 21 8.50	3.745	20 11 14.8	14.30	9.836 5027	592.7	7.36	12.82	11 26.1
20	9 19 39.38	3.681	20 16 50.3	13.66	9.837 9901	646.6	7.33	12.78	11 20.7
21	9 18 11.87	−3.611	+20 22 10.2	+13.00	9.839 6056	+ 699.4	7.31	12.74	11 15.3
22	9 16 46.12	3.535	20 27 14.2	12.33	9.841 3460	750.8	7.28	12.69	11 10.0
23	9 15 22.26	3.452	20 32 2.0	11.65	9.843 2083	800.9	7.25	12.63	11 4.7
24	9 14 0.44	3.365	20 36 33.4	10.97	9.845 1891	849.5	7.22	12.57	10 59.4
25	9 12 40.78	3.272	20 40 48.3	10.27	9.847 2848	896.7	7.18	12.51	10 54.2
26	9 11 23.41	−3.174	+20 44 46.5	+ 9.57	9.849 4920	+ 942.4	7.14	12.45	10 49.0
27	9 10 8.45	3.072	20 48 27.9	8.87	9.851 8069	986.5	7.10	12.38	10 43.8
28	9 8 56.01	2.964	20 51 52.4	8.17	9.854 2258	1029.0	7.06	12.31	10 38.7
29	9 7 46.19	2.853	20 55 0.0	7.46	9.856 7450	1069.9	7.02	12.24	10 33.7
lar. 1	9 6 39.10	2.737	20 57 50.7	6.76	9.859 3601	1109.0	6.98	12.17	10 28.6
2	9 5 34.83	−2.618	+21 0 24.4	+ 6.05	9.862 0670	+1146.4	6.94	12.10	10 23.7
3	9 4 33.47	2.495	21 2 41.3	5.35	9.864 8614	1182.0	6.90	12.02	10 18.7
4	9 3 35.08	2.370	21 4 41.4	4.66	9.867 7391	1215.7	6.85	11.94	10 13.9
5	9 2 39.74	2.242	21 6 24.9	3.97	9.870 6956	1247.7	6.80	11.85	10 9.0
6	9 1 47.48	2.112	21 7 52.0	3.29	9.873 7266	1277.8	6.75	11.77	10 4.3
7	9 0 58.37	−1.980	+21 9 2.8	+ 2.62	9.876 8278	+1306.1	6.70	11.68	9 59.5
8	9 0 12.44	1.847	21 9 57.7	1.96	9.879 9947	1332.7	6.66	11.60	9 54.9
9	8 59 29.71	1.714	21 10 36.9	1.31	9.883 2233	1357.5	6.61	11.51	9 50.2
10	8 58 50.20	1.579	21 11 0.7	0.67	9.886 5095	1380.7	6.56	11.43	9 45.7
11	8 58 13.93	1.444	21 11 9.2	+ 0.04	9.889 8492	1402.1	6.51	11.34	9 41.2
12	8 57 40.90	−1.309	+21 11 2.9	− 0.57	9.893 2385	+1422.0	6.46	11.25	9 36.7
13	8 57 11.10	1.174	21 10 42.1	1.17	9.896 6735	1440.3	6.41	11.16	9 32.3
14	8 56 44.54	1.040	21 10 7.0	1.76	9.900 1506	1457.1	6.35	11.07	9 28.0
15	8 56 21.19	0.906	21 9 17.9	2.33	9.903 6663	1472.4	6.30	10.98	9 23.7
16	8 56 1.04	0.773	21 8 15.2	2.89	9.907 2170	1486.3	6.25	10.90	9 19.4
17	8 55 44.06	−0.642	+21 6 59.1	− 3.44	9.910 7995	+1498.9	6.20	10.81	9 15.2
18	8 55 30.23	0.511	21 5 30.0	3.98	9.914 4109	1510.3	6.15	10.72	9 11.1
19	8 55 19.51	0.382	21 3 48.2	4.50	9.918 0480	1520.5	6.10	10.63	9 7.0
20	8 55 11.88	0.254	21 1 54.0	5.01	9.921 7082	1529.5	6.05	10.54	9 3.0
21	8 55 7.29	0.128	20 59 47.6	5.52	9.925 3889	1537.5	6.00	10.45	8 59.0
22	8 55 5.71	−0.004	+20 57 29.3	− 6.01	9.929 0875	+1544.5	5.95	10.36	8 55.0
23	8 55 7.11	+0.120	20 54 59.4	6.49	9.932 8016	1550.5	5.90	10.27	8 51.1
24	8 55 11.44	0.241	20 52 18.1	6.96	9.936 5290	1555.5	5.85	10.19	8 47.3
25	8 55 18.66	0.361	20 49 25.6	7.42	9.940 2675	1559.7	5.80	10.10	8 43.5
26	8 55 28.74	0.479	20 46 22.1	7.87	9.944 0150	1563.0	5.75	10.02	8 39.7
27	8 55 41.62	+0.595	+20 43 7.8	− 8.32	9.947 7694	+1565.5	5.70	9.93	8 36.0
28	8 55 57.28	0.710	20 39 42.8	8.76	9.951 5290	1567.2	5.65	9.84	8 32.4
29	8 56 15.68	0.823	20 36 7.2	9.20	9.955 2916	1568.1	5.60	9.76	8 28.8
30	8 56 36.76	0.934	20 32 21.4	9.62	9.959 0555	1568.3	5.55	9.67	8 25.2
31	8 57 0.48	1.043	20 28 25.4	10.04	9.962 8187	1567.6	5.50	9.59	8 21.7
r. 1	8 57 26.81	+1.151	+20 24 19.4	−10.45	9.966 5796	+1566.3	5.46	9.51	8 18.2
2	8 57 55.70	+1.256	+20 20 3.6	−10.86	9.970 3365	+1564.3	5.41	9.43	8 14.8

MARS, 1916.

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″			″	″	h m
Apr. 1	8 57 26.81	+1.151	+20 24 19.4	−10.45	9.966 5796	+1566.3	5.46	9.51	8 18.2
2	8 57 55.70	1.256	20 20 3.6	10.86	9.970 3365	1564.3	5.41	9.43	8 14.8
3	8 58 27.09	1.360	20 15 38.0	11.26	9.974 0876	1561.5	5.37	9.35	8 11.4
4	8 59 0.94	1.461	20 11 2.9	11.66	9.977 8314	1558.2	5.32	9.27	8 8.0
5	8 59 37.20	1.560	20 6 18.3	12.05	9.981 5664	1554.2	5.28	9.19	8 4.7
6	9 0 15.81	+1.657	+20 1 24.5	−12.43	9.985 2912	+1549.7	5.23	9.11	8 1.4
7	9 0 56.74	1.752	19 56 21.5	12.81	9.989 0046	1544.7	5.18	9.03	7 58.2
8	9 1 39.91	1.845	19 51 9.6	13.18	9.992 7053	1539.2	5.14	8.96	7 55.0
9	9 2 25.29	1.936	19 45 48.9	13.55	9.996 3923	1533.2	5.10	8.88	7 51.8
10	9 3 12.82	2.024	19 40 19.4	13.91	0.000 0645	1526.8	5.05	8.80	7 48.7
11	9 4 2.44	+2.110	+19 34 41.4	−14.26	0.003 7208	+1520.0	5.01	8.72	7 45.6
12	9 4 54.10	2.195	19 28 54.9	14.61	0.007 3604	1512.9	4.97	8.65	7 42.5
13	9 5 47.76	2.276	19 23 0.1	14.96	0.010 9825	1505.5	4.92	8.58	7 39.5
14	9 6 43.35	2.356	19 16 57.0	15.30	0.014 5864	1497.7	4.88	8.51	7 36.5
15	9 7 40.83	2.434	19 10 45.8	15.63	0.018 1714	1489.7	4.84	8.44	7 33.5
16	9 8 40.14	+2.509	+19 4 26.7	−15.96	0.021 7370	+1481.6	4.80	8.37	7 30.6
17	9 9 41.25	2.583	18 57 59.7	16.29	0.025 2827	1473.2	4.76	8.30	7 27.7
18	9 10 44.10	2.654	18 51 24.9	16.61	0.028 8081	1464.6	4.72	8.23	7 24.8
19	9 11 48.64	2.724	18 44 42.4	16.93	0.032 3128	1456.0	4.68	8.16	7 21.9
20	9 12 54.85	2.793	18 37 52.2	17.25	0.035 7966	1447.2	4.64	8.10	7 19.1
21	9 14 2.67	+2.859	+18 30 54.4	−17.57	0.039 2592	+1438.3	4.61	8.03	7 16.3
22	9 15 12.06	2.924	18 23 48.9	17.88	0.042 7003	1429.3	4.57	7.97	7 13.5
23	9 16 22.99	2.987	18 16 36.0	18.19	0.046 1197	1420.2	4.54	7.91	7 10.8
24	9 17 35.43	3.049	18 9 15.6	18.51	0.049 5171	1411.0	4.51	7.85	7 8.1
25	9 18 49.34	3.110	18 1 47.7	18.82	0.052 8924	1401.7	4.47	7.79	7 5.4
26	9 20 4.69	+3.169	+17 54 12.4	−19.12	0.056 2452	+1392.3	4.44	7.73	7 2.7
27	9 21 21.44	3.227	17 46 29.7	19.43	0.059 5752	1382.7	4.40	7.67	7 0.0
28	9 22 39.56	3.283	17 38 39.6	19.74	0.062 8821	1373.0	4.37	7.61	6 57.4
29	9 23 59.03	3.339	17 30 42.2	20.04	0.066 1657	1363.3	4.33	7.55	6 54.8
30	9 25 19.81	3.392	17 22 37.5	20.35	0.069 4258	1353.4	4.30	7.50	6 52.2
May 1	9 26 41.86	+3.445	+17 14 25.5	−20.65	0.072 6619	+1343.4	4.27	7.44	6 49.7
2	9 28 5.15	3.496	17 6 6.3	20.95	0.075 8740	1333.3	4.24	7.39	6 47.1
3	9 29 29.66	3.546	16 57 39.9	21.25	0.079 0617	1323.1	4.21	7.34	6 44.6
4	9 30 55.35	3.595	16 49 6.4	21.54	0.082 2250	1312.9	4.18	7.29	6 42.1
5	9 32 22.19	3.642	16 40 25.9	21.83	0.085 3635	1302.5	4.15	7.23	6 39.6
6	9 33 50.14	+3.688	+16 31 38.4	−22.12	0.088 4772	+1292.2	4.12	7.18	6 37.1
7	9 35 19.19	3.732	16 22 43.9	22.42	0.091 5660	1281.8	4.09	7.13	6 34.7
8	9 36 49.29	3.776	16 13 42.5	22.70	0.094 6297	1271.3	4.06	7.08	6 32.2
9	9 38 20.43	3.818	16 4 34.3	22.98	0.097 6683	1260.9	4.04	7.03	6 29.8
10	9 39 52.56	3.859	15 55 19.4	23.26	0.100 6818	1250.4	4.01	6.98	6 27.4
11	9 41 25.66	+3.899	+15 45 57.8	−23.54	0.103 6702	+1239.9	3.98	6.93	6 25.0
12	9 42 59.70	3.938	15 36 29.5	23.82	0.106 6334	1229.5	3.95	6.88	6 22.7
13	9 44 34.66	3.975	15 26 54.6	24.09	0.109 5717	1219.1	3.92	6.83	6 20.3
14	9 46 10.51	4.012	15 17 13.3	24.36	0.112 4850	1208.7	3.90	6.79	6 18.0
15	9 47 47.22	4.047	15 7 25.5	24.62	0.115 3734	1198.3	3.87	6.75	6 15.7
16	9 49 24.76	+4.082	+14 57 31.3	−24.89	0.118 2371	+1188.1	3.85	6.70	6 13.4
17	*9 51 3.13*	+4.115	+14 47 30.7	−25.15	0.121 0763	+1177.9	3.82	6.65	6 11.1

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension. Noon.	Var. per Hour. Noon.	Apparent Declination. Noon.	Var. per Hour. Noon.	Logarithm of Distance from Earth. Noon.	Var. per Hour. Noon.	Semi-diameter. Noon.	Hor. Parallax. Noon.	Transit, Meridian of Greenwich.
	h m s	s	° ′ ″	″			″	″	h m
lay 17	9 51 3.13	+4.115	+14 47 30.7	−25.15	0.121 0763	+1177.9	3.82	6.65	6 11.1
18	9 52 42.28	4.148	14 37 23.9	25.41	0.123 8913	1167.9	3.79	6.61	6 8.8
19	9 54 22.21	4.180	14 27 10.8	25.67	0.126 6823	1157.9	3.77	6.57	6 6.5
20	9 56 2.89	4.210	14 16 51.5	25.93	0.129 4494	1148.0	3.75	6.53	6 4.2
21	9 57 44.31	4.241	14 6 26.0	26.19	0.132 1928	1138.2	3.73	6.49	6 2.0
22	9 59 26.46	+4.271	+13 55 54.4	−26.45	0.134 9127	+1128.5	3.70	6.45	5 59.8
23	10 1 9.32	4.300	13 45 16.6	26.70	0.137 6094	1118.7	3.68	6.41	5 57.6
24	10 2 52.87	4.329	13 34 32.8	26.96	0.140 2827	1109.1	3.66	6.37	5 55.3
25	10 4 37.11	4.357	13 23 42.7	27.21	0.142 9330	1099.5	3.63	6.33	5 53.1
26	10 6 22.01	4.385	13 12 46.6	27.46	0.145 5601	1089.8	3.61	6.29	5 50.9
27	10 8 7.57	+4.412	+13 1 44.4	−27.72	0.148 1642	+1080.3	3.59	6.25	5 48.8
28	10 9 53.78	4.438	12 50 36.2	27.97	0.150 7454	1070.7	3.57	6.22	5 46.6
29	10 11 40.61	4.464	12 39 22.0	28.21	0.153 3036	1061.1	3.55	6.18	5 44.4
30	10 13 28.06	4.490	12 28 1.9	28.46	0.155 8389	1051.6	3.53	6.15	5 42.3
31	10 15 16.11	4.515	12 16 35.9	28.70	0.158 3513	1042.1	3.51	6.11	5 40.2
une 1	10 17 4.76	+4.539	+12 5 4.1	−28.94	0.160 8408	+1032.6	3.49	6.08	5 38.0
2	10 18 53.98	4.562	11 53 26.6	29.18	0.163 3076	1023.1	3.47	6.04	5 35.9
3	10 20 43.76	4.586	11 41 43.4	29.42	0.165 7516	1013.6	3.45	6.01	5 33.8
4	10 22 34.10	4.609	11 29 54.5	29.65	0.168 1730	1004.2	3.43	5.97	5 31.7
5	10 24 24.97	4.631	11 18 0.1	29.88	0.170 5719	994.9	3.41	5.94	5 29.6
6	10 26 16.37	+4.652	+11 6 0.2	−30.11	0.172 9484	+ 985.5	3.39	5.91	5 27.5
7	10 28 8.28	4.673	10 53 54.9	30.33	0.175 3025	976.2	3.37	5.88	5 25.5
8	10 30 0.69	4.694	10 41 44.2	30.55	0.177 6344	967.0	3.35	5.84	5 23.4
9	10 31 53.58	4.714	10 29 28.3	30.77	0.179 9442	957.8	3.33	5.81	5 21.3
10	10 33 46.95	4.733	10 17 7.2	30.99	0.182 2321	948.7	3.32	5.78	5 19.3
11	10 35 40.78	+4.752	+10 4 41.0	−31.20	0.184 4983	+ 939.7	3.30	5.75	5 17.3
12	10 37 35.06	4.771	9 52 9.7	31.41	0.186 7430	930.8	3.29	5.72	5 15.2
13	10 39 29.79	4.790	9 39 33.4	31.61	0.188 9663	922.0	3.27	5.69	5 13.2
14	10 41 24.96	4.807	9 26 52.3	31.81	0.191 1686	913.3	3.25	5.66	5 11.2
15	10 43 20.55	4.825	9 14 6.3	32.02	0.193 3501	904.7	3.23	5.63	5 9.2
16	10 45 16.56	+4.842	+ 9 1 15.5	−32.21	0.195 5111	+ 896.1	3.21	5.60	5 7.2
17	10 47 12.98	4.860	8 48 20.0	32.41	0.197 6517	887.7	3.20	5.58	5 5.2
18	10 49 9.82	4.876	8 35 19.8	32.60	0.199 7723	879.4	3.19	5.55	5 3.2
19	10 51 7.05	4.893	8 22 15.0	32.80	0.201 8731	871.2	3.17	5.53	5 1.2
20	10 53 4.69	4.910	8 9 5.5	32.99	0.203 9543	863.1	3.16	5.50	4 59.2
21	10 55 2.72	+4.926	+ 7 55 51.5	−33.18	0.206 0161	+ 855.0	3.15	5.48	4 57.2
22	10 57 1.16	4.943	7 42 32.9	33.37	0.208 0585	847.0	3.13	5.45	4 55.3
23	10 58 59.99	4.960	7 29 9.8	33.55	0.210 0817	839.0	3.12	5.43	4 53.3
24	11 0 59.22	4.976	7 15 42.3	33.74	0.212 0857	831.0	3.10	5.40	4 51.4
25	11 2 58.84	4.992	7 2 10.5	33.91	0.214 0707	823.1	3.09	5.38	4 49.4
26	11 4 58.85	+5.009	+ 6 48 34.4	−34.09	0.216 0368	+ 815.3	3.07	5.35	4 47.5
27	11 6 59.25	5.025	6 34 54.1	34.27	0.217 9840	807.4	3.06	5.33	4 45.5
28	11 9 0.03	5.040	6 21 9.6	34.44	0.219 9125	799.7	3.04	5.30	4 43.6
29	11 11 1.19	5.056	6 7 20.9	34.61	0.221 8224	791.9	3.03	5.28	4 41.7
30	11 13 2.72	5.071	5 53 28.3	34.77	0.223 7135	784.1	3.02	5.26	4 39.8
ly 1	11 15 4.62	+5.087	+ 5 39 31.7	−34.94	0.225 5861	+ 776.4	3.01	5.24	4 37.9
2	11 17 6.90	+5.103	+ 5 25 31.3	−35.10	0.227 4401	+ 768.6	2.99	5.21	4 36.0

MARS, 1916.

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h m
July 1	11 15 4.62	+5.087	+5 39 31.7	−34.94	0.225 5861	+776.4	3.01	5.24	4 37.9
2	11 17 6.90	5.103	5 25 31.3	35.10	0.227 4401	768.6	2.99	5.21	4 36.0
3	11 19 9.55	5.118	5 11 27.1	35.25	0.229 2756	761.0	2.98	5.19	4 34.1
4	11 21 12.56	5.133	4 57 19.2	35.40	0.231 0927	753.3	2.97	5.17	4 32.2
5	11 23 15.93	5.148	4 43 7.7	35.55	0.232 8916	745.8	2.96	5.15	4 30.3
6	11 25 19.66	+5.163	+4 28 52.7	−35.70	0.234 6724	+738.2	2.94	5.13	4 28.4
7	11 27 23.74	5.177	4 14 34.3	35.84	0.236 4352	730.8	2.93	5.11	4 26.6
8	11 29 28.17	5.192	4 0 12.5	35.97	0.238 1803	723.4	2.92	5.09	4 24.7
9	11 31 32.95	5.206	3 45 47.5	36.11	0.239 9076	716.0	2.91	5.07	4 22.8
10	11 33 38.08	5.221	3 31 19.4	36.23	0.241 6173	708.8	2.90	5.05	4 21.0
11	11 35 43.55	+5.235	+3 16 48.3	−36.36	0.243 3098	+701.6	2.89	5.03	4 19.1
12	11 37 49.36	5.249	3 2 14.2	36.48	0.244 9852	694.5	2.88	5.01	4 17.3
13	11 39 55.51	5.263	2 47 37.2	36.60	0.246 6437	687.6	2.86	4.99	4 15.5
14	11 42 2.00	5.278	2 32 57.4	36.71	0.248 2856	680.7	2.85	4.97	4 13.6
15	11 44 8.84	5.292	2 18 14.9	36.83	0.249 9110	673.9	2.84	4.95	4 11.8
16	11 46 16.02	+5.306	+2 3 29.7	−36.94	0.251 5203	+667.2	2.83	4.93	4 10.0
17	11 48 23.54	5.321	1 48 42.0	37.04	0.253 1135	660.6	2.82	4.91	4 8.2
18	11 50 31.41	5.335	1 33 51.8	37.14	0.254 6909	654.0	2.81	4.89	4 6.4
19	11 52 39.63	5.350	1 18 59.1	37.25	0.256 2527	647.5	2.80	4.88	4 4.6
20	11 54 48.22	5.365	1 4 3.9	37.35	0.257 7989	641.0	2.79	4.86	4 2.8
21	11 56 57.16	+5.380	+0 49 6.5	−37.44	0.259 3296	+634.6	2.78	4.85	4 1.0
22	11 59 6.47	5.396	0 34 6.8	37.53	0.260 8451	628.2	2.77	4.83	3 59.2
23	12 1 16.15	5.411	0 19 4.9	37.62	0.262 3452	621.9	2.76	4.82	3 57.4
24	12 3 26.20	5.427	+0 4 0.9	37.71	0.263 8302	615.6	2.75	4.80	3 55.6
25	12 5 36.63	5.442	−0 11 5.0	37.79	0.265 3000	609.3	2.74	4.78	3 53.9
26	12 7 47.43	+5.458	−0 26 12.8	−37.86	0.266 7547	+603.0	2.73	4.76	3 52.1
27	12 9 58.61	5.474	0 41 22.5	37.94	0.268 1944	596.7	2.72	4.75	3 50.4
28	12 12 10.18	5.490	0 56 33.9	38.01	0.269 6190	590.5	2.71	4.73	3 48.6
29	12 14 22.13	5.506	1 11 46.9	38.07	0.271 0288	584.3	2.71	4.72	3 46.9
30	12 16 34.47	5.522	1 27 1.4	38.14	0.272 4237	578.1	2.70	4.70	3 45.1
31	12 18 47.20	+5.539	−1 42 17.4	−38.19	0.273 8038	+572.0	2.69	4.69	3 43.4
Aug. 1	12 21 0.32	5.555	1 57 34.7	38.25	0.275 1692	565.9	2.68	4.67	3 41.7
2	12 23 13.84	5.572	2 12 53.2	38.29	0.276 5199	559.8	2.67	4.66	3 40.0
3	12 25 27.76	5.588	2 28 12.8	38.34	0.277 8561	553.7	2.66	4.64	3 38.3
4	12 27 42.07	5.605	2 43 33.3	38.37	0.279 1779	547.7	2.66	4.63	3 36.6
5	12 29 56.78	+5.621	−2 58 54.7	−38.40	0.280 4853	+541.8	2.65	4.61	3 34.9
6	12 32 11.89	5.638	3 14 16.8	38.43	0.281 7785	535.9	2.64	4.60	3 33.2
7	12 34 27.40	5.655	3 29 39.6	38.46	0.283 0575	530.0	2.63	4.58	3 31.5
8	12 36 43.31	5.671	3 45 2.8	38.48	0.284 3226	524.2	2.62	4.57	3 29.8
9	12 38 59.63	5.689	4 0 26.5	38.49	0.285 5738	518.5	2.62	4.56	3 28.2
10	12 41 16.36	+5.706	−4 15 50.5	−38.50	0.286 8115	+512.9	2.61	4.55	3 26.5
11	12 43 33.51	5.723	4 31 14.6	38.51	0.288 0357	507.3	2.60	4.53	3 24.8
12	12 45 51.07	5.741	4 46 38.8	38.51	0.289 2466	501.8	2.59	4.52	3 23.2
13	12 48 9.06	5.758	5 2 3.0	38.51	0.290 4445	496.4	2.59	4.51	3 21.6
14	12 50 27.47	5.776	5 17 27.1	38.50	0.291 6296	491.2	2.58	4.49	3 19.9
15	12 52 46.32	+5.795	−5 32 50.9	−38.49	0.292 8021	+485.9	2.57	4.48	3 18.3
16	12 55 5.61	+5.813	−5 48 14.5	−38.47	0.293 9620	+480.7	2.57	4.47	3 16.7

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h m
Aug. 16	12 55 5.61	+5.813	− 5 48 14.5	−38.47	0.293 9620	+480.7	2.57	4.47	3 16.7
17	12 57 25.34	5.831	6 3 37.6	38.45	0.295 1095	475.5	2.56	4.46	3 15.1
18	12 59 45.52	5.851	6 19 0.3	38.43	0.296 2446	470.4	2.55	4.45	3 13.5
19	13 2 6.17	5.870	6 34 22.3	38.40	0.297 3676	465.4	2.55	4.44	3 11.9
20	13 4 27.28	5.890	6 49 43.7	38.37	0.298 4784	460.3	2.54	4.43	3 10.3
21	13 6 48.88	+5.910	− 7 5 4.2	−38.34	0.299 5771	+455.3	2.54	4.42	3 8.7
22	13 9 10.95	5.930	7 20 23.8	38.29	0.300 6637	450.2	2.53	4.41	3 7.1
23	13 11 33.51	5.950	7 35 42.3	38.25	0.301 7382	445.2	2.52	4.39	3 5.6
24	13 13 56.57	5.971	7 50 59.6	38.19	0.302 8007	440.2	2.51	4.38	3 4.0
25	13 16 20.12	5.992	8 6 15.6	38.14	0.303 8513	435.2	2.51	4.37	3 2.5
26	13 18 44.18	+6.013	− 8 21 30.2	−38.07	0.304 8899	+430.3	2.50	4.36	3 0.9
27	13 21 8.74	6.034	8 36 43.2	38.01	0.305 9167	425.4	2.50	4.35	2 59.4
28	13 23 33.82	6.056	8 51 54.5	37.93	0.306 9317	420.4	2.49	4.34	2 57.9
29	13 25 59.41	6.077	9 7 4.0	37.85	0.307 9348	415.5	2.49	4.33	2 56.4
30	13 28 25.53	6.099	9 22 11.5	37.77	0.308 9263	410.7	2.48	4.32	2 54.9
31	13 30 52.17	+6.121	− 9 37 16.9	−37.68	0.309 9061	+405.8	2.47	4.31	2 53.4
Sept. 1	13 33 19.35	6.143	9 52 20.0	37.58	0.310 8742	401.0	2.47	4.30	2 51.9
2	13 35 47.05	6.165	10 7 20.7	37.47	0.311 8309	396.2	2.46	4.29	2 50.4
3	13 38 15.29	6.188	10 22 18.8	37.36	0.312 7761	391.5	2.46	4.28	2 48.9
4	13 40 44.07	6.210	10 37 14.2	37.25	0.313 7099	386.8	2.45	4.28	2 47.5
5	13 43 13.38	+6.233	−10 52 6.8	−37.13	0.314 6326	+382.1	2.45	4.27	2 46.0
6	13 45 43.25	6.256	11 6 56.4	37.00	0.315 5441	377.5	2.44	4.26	2 44.6
7	13 48 13.66	6.279	11 21 42.9	36.87	0.316 4448	373.0	2.44	4.25	2 43.1
8	13 50 44.63	6.302	11 36 26.1	36.73	0.317 3347	368.6	2.43	4.24	2 41.7
9	13 53 16.15	6.325	11 51 5.8	36.58	0.318 2140	364.2	2.43	4.23	2 40.3
10	13 55 48.24	+6.349	−12 5 42.0	−36.43	0.319 0829	+359.9	2.42	4.22	2 38.9
11	13 58 20.90	6.373	12 20 14.4	36.27	0.319 9415	355.6	2.42	4.21	2 37.5
12	14 0 54.14	6.397	12 34 43.1	36.11	0.320 7899	351.4	2.41	4.20	2 36.1
13	14 3 27.95	6.421	12 49 7.7	35.94	0.321 6284	347.3	2.41	4.20	2 34.7
14	14 6 2.36	6.446	13 3 28.3	35.77	0.322 4569	343.2	2.40	4.19	2 33.4
15	14 8 37.36	+6.471	−13 17 44.6	−35.59	0.323 2757	+339.2	2.40	4.18	2 32.0
16	14 11 12.97	6.496	13 31 56.5	35.40	0.324 0849	335.1	2.39	4.17	2 30.7
17	14 13 49.18	6.522	13 46 3.9	35.21	0.324 8844	331.1	2.39	4.16	2 29.3
18	14 16 26.02	6.548	14 0 6.6	35.01	0.325 6744	327.2	2.38	4.16	2 28.0
19	14 19 3.48	6.574	14 14 4.4	34.80	0.326 4549	323.2	2.38	4.15	2 26.7
20	14 21 41.57	+6.600	−14 27 57.2	−34.59	0.327 2258	+319.2	2.38	4.14	2 25.4
21	14 24 20.29	6.627	14 41 44.9	34.38	0.327 9873	315.3	2.37	4.13	2 24.1
22	14 26 59.65	6.653	14 55 27.3	34.15	0.328 7393	311.4	2.37	4.12	2 22.8
23	14 29 39.65	6.680	15 9 4.3	33.92	0.329 4819	307.5	2.36	4.12	2 21.5
24	14 32 20.30	6.707	15 22 35.6	33.68	0.330 2152	303.6	2.36	4.11	2 20.3
25	14 35 1.60	+6.735	−15 36 1.1	−33.44	0.330 9391	+299.7	2.35	4.10	2 19.0
26	14 37 43.56	6.762	15 49 20.6	33.18	0.331 6537	295.8	2.35	4.10	2 17.8
27	14 40 26.17	6.789	16 2 33.9	32.92	0.332 3590	292.0	2.35	4.09	2 16.6
28	14 43 9.44	6.817	16 15 40.9	32.66	0.333 0551	288.1	2.34	4.08	2 15.3
29	14 45 53.37	6.844	16 28 41.4	32.38	0.333 7420	284.3	2.34	4.08	2 14.1
30	14 48 37.97	+6.872	−16 41 35.2	−32.10	0.334 4197	+280.5	2.34	4.07	2 12.9
Oct. 1	14 51 23.23	+6.900	−16 54 22.1	−31.81	0.335 0884	+276.7	2.34	4.07	2 11.7

MARS, 1916.

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h m
Oct. 1	14 51 23.23	+6.900	−16 54 22.1	−31.81	0.335 0884	+276.7	2.34	4.07	2 11.7
2	14 54 9.15	6.927	17 7 2.0	31.51	0.335 7481	273.0	2.33	4.06	2 10.6
3	14 56 55.74	6.955	17 19 34.6	31.21	0.336 3989	269.3	2.32	4.05	2 9.4
4	14 59 42.99	6.982	17 31 59.9	30.90	0.337 0409	265.7	2.32	4.04	2 8.3
5	15 2 30.90	7.010	17 44 17.5	30.57	0.337 6744	262.2	2.32	4.04	2 7.1
6	15 5 19.48	+7.038	−17 56 27.4	−30.25	0.338 2994	+258.7	2.31	4.03	2 6.0
7	15 8 8.73	7.066	18 8 29.3	29.91	0.338 9160	255.2	2.31	4.03	2 4.9
8	15 10 58.64	7.094	18 20 23.1	29.57	0.339 5244	251.8	2.31	4.02	2 3.7
9	15 13 49.22	7.121	18 32 8.6	29.22	0.340 1248	248.5	2.31	4.02	2 2.6
10	15 16 40.47	7.149	18 43 45.8	28.87	0.340 7173	245.2	2.30	4.01	2 1.6
11	15 19 32.39	+7.177	−18 55 14.4	−28.51	0.341 3019	+242.0	2.30	4.01	2 0.5
12	15 22 24.99	7.206	19 6 34.1	28.14	0.341 8789	238.8	2.30	4.00	1 59.4
13	15 25 18.27	7.234	19 17 44.9	27.76	0.342 4482	235.7	2.30	4.00	1 58.4
14	15 28 12.23	7.262	19 28 46.6	27.38	0.343 0101	232.6	2.29	3.99	1 57.3
15	15 31 6.87	7.291	19 39 38.9	26.98	0.343 5645	229.5	2.29	3.99	1 56.3
16	15 34 2.20	+7.320	−19 50 21.7	−26.59	0.344 1117	+226.5	2.28	3.98	1 55.3
17	15 36 58.20	7.348	20 0 54.9	26.18	0.344 6515	223.4	2.28	3.98	1 54.3
18	15 39 54.89	7.376	20 11 18.3	25.77	0.345 1841	220.4	2.28	3.97	1 53.3
19	15 42 52.26	7.405	20 21 31.7	25.35	0.345 7096	217.4	2.28	3.97	1 52.3
20	15 45 50.31	7.433	20 31 34.9	24.92	0.346 2278	214.4	2.27	3.96	1 51.3
21	15 48 49.04	+7.461	−20 41 27.7	−24.48	0.346 7388	+211.4	2.27	3.96	1 50.4
22	15 51 48.45	7.490	20 51 9.9	24.04	0.347 2425	208.4	2.27	3.95	1 49.4
23	15 54 48.54	7.517	21 0 41.4	23.59	0.347 7391	205.5	2.26	3.94	1 48.5
24	15 57 49.29	7.545	21 10 2.0	23.13	0.348 2285	202.5	2.26	3.94	1 47.5
25	16 0 50.71	7.573	21 19 11.5	22.66	0.348 7109	199.5	2.26	3.93	1 46.6
26	16 3 52.79	+7.600	−21 28 9.8	−22.19	0.349 1863	+196.6	2.26	3.93	1 45.7
27	16 6 55.53	7.628	21 36 56.5	21.71	0.349 6546	193.7	2.26	3.93	1 44.8
28	16 9 58.92	7.655	21 45 31.7	21.22	0.350 1160	190.8	2.25	3.92	1 43.9
29	16 13 2.95	7.681	21 53 55.0	20.72	0.350 5705	187.9	2.25	3.92	1 43.1
30	16 16 7.61	7.707	22 2 6.3	20.22	0.351 0181	185.1	2.25	3.91	1 42.2
31	16 19 12.90	+7.733	−22 10 5.5	−19.71	0.351 4588	+182.2	2.25	3.91	1 41.3
Nov. 1	16 22 18.81	7.759	22 17 52.3	19.19	0.351 8928	179.5	2.25	3.91	1 40.5
2	16 25 25.32	7.784	22 25 26.5	18.66	0.352 3202	176.7	2.24	3.91	1 39.7
3	16 28 32.43	7.809	22 32 48.1	18.13	0.352 7411	174.1	2.24	3.90	1 38.8
4	16 31 40.14	7.833	22 39 56.9	17.60	0.353 1557	171.5	2.24	3.90	1 38.0
5	16 34 48.42	+7.857	−22 46 52.8	−17.05	0.353 5641	+168.9	2.24	3.89	1 37.2
6	16 37 57.28	7.881	22 53 35.5	16.50	0.353 9664	166.4	2.24	3.89	1 36.4
7	16 41 6.70	7.904	23 0 4.9	15.95	0.354 3629	164.0	2.23	3.89	1 35.7
8	16 44 16.69	7.927	23 6 20.9	15.38	0.354 7535	161.6	2.23	3.88	1 34.9
9	16 47 27.22	7.950	23 12 23.3	14.81	0.355 1385	159.2	2.23	3.88	1 34.1
10	16 50 38.30	+7.973	−23 18 11.9	−14.24	0.355 5179	+156.9	2.23	3.87	1 33.3
11	16 53 49.91	7.995	23 23 46.7	13.66	0.355 8918	154.7	2.22	3.87	1 32.6
12	16 57 2.05	8.017	23 29 7.4	13.07	0.356 2603	152.4	2.22	3.87	1 31.9
13	17 0 14.71	8.038	23 34 13.9	12.47	0.356 6234	150.1	2.22	3.87	1 31.1
14	17 3 27.87	8.059	23 39 6.1	11.87	0.356 9812	148.0	2.22	3.86	1 30.4
15	17 6 41.53	+8.079	−23 43 43.9	−11.27	0.357 3338	+145.8	2.22	3.86	1 29.7
16	17 9 55.67	+8.099	−23 48 7.2	−10.66	0.357 6812	+143.7	2.22	3.86	1 29.0

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″			″	″	h m
Nov. 16	17 9 55.67	+8.099	−23 48 7.2	−10.66	0.357 6812	+143.7	2.22	3.86	1 29.0
17	17 13 10.28	8.119	23 52 15.8	10.05	0.358 0235	141.5	2.22	3.86	1 28.3
18	17 16 25.36	8.138	23 56 9.5	9.43	0.358 3606	139.4	2.21	3.85	1 27.6
19	17 19 40.89	8.156	23 59 48.3	8.80	0.358 6927	137.3	2.21	3.85	1 26.9
20	17 22 56.86	8.174	24 3 12.0	8.17	0.359 0196	135.2	2.21	3.84	1 26.2
21	17 26 13.24	+8.191	−24 6 20.5	− 7.54	0.359 3415	+133.0	2.21	3.84	1 25.6
22	17 29 30.04	8.208	24 9 13.7	6.90	0.359 6582	130.9	2.20	3.84	1 24.9
23	17 32 47.24	8.225	24 11 51.5	6.25	0.359 9698	128.8	2.20	3.84	1 24.3
24	17 36 4.82	8.240	24 14 13.8	5.60	0.360 2763	126.6	2.20	3.83	1 23.6
25	17 39 22.76	8.255	24 16 20.4	4.95	0.360 5777	124.6	2.20	3.83	1 22.9
26	17 42 41.04	+8.269	−24 18 11.4	− 4.30	0.360 8742	+122.5	2.20	3.83	1 22.3
27	17 45 59.65	8.282	24 19 46.6	3.64	0.361 1657	120.4	2.20	3.83	1 21.7
28	17 49 18.57	8.294	24 21 6.0	2.98	0.361 4522	118.4	2.20	3.83	1 21.1
29	17 52 37.78	8.306	24 22 9.5	2.31	0.361 7340	116.4	2.19	3.82	1 20.5
30	17 55 57.27	8.317	24 22 56.9	1.64	0.362 0111	114.5	2.19	3.82	1 19.8
Dec. 1	17 59 17.01	+8.327	−24 23 28.3	− 0.97	0.362 2835	+112.6	2.19	3.82	1 19.2
2	18 2 36.99	8.337	24 23 43.5	− 0.30	0.362 5515	110.7	2.19	3.82	1 18.6
3	18 5 57.19	8.346	24 23 42.6	+ 0.38	0.362 8151	108.9	2.19	3.82	1 18.0
4	18 9 17.59	8.354	24 23 25.4	1.05	0.363 0744	107.2	2.19	3.82	1 17.4
5	18 12 38.18	8.361	24 22 52.0	1.73	0.363 3297	105.5	2.19	3.81	1 16.8
6	18 15 58.94	+8.368	−24 22 2.3	+ 2.41	0.363 5810	+103.9	2.19	3.81	1 16.2
7	18 19 19.85	8.374	24 20 56.3	3.09	0.363 8284	102.3	2.19	3.81	1 15.6
8	18 22 40.91	8.380	24 19 33.9	3.77	0.364 0720	100.7	2.18	3.81	1 15.0
9	18 26 2.09	8.385	24 17 55.1	4.46	0.364 3119	99.2	2.18	3.80	1 14.4
10	18 29 23.38	8.389	24 15 59.9	5.14	0.364 5482	97.7	2.18	3.80	1 13.8
11	18 32 44.76	+8.392	−24 13 48.3	+ 5.83	0.364 7809	+ 96.2	2.18	3.80	1 13.3
12	18 36 6.22	8.396	24 11 20.2	6.51	0.365 0101	94.8	2.18	3.80	1 12.7
13	18 39 27.75	8.398	24 8 35.7	7.20	0.365 2359	93.4	2.18	3.80	1 12.1
14	18 42 49.32	8.400	24 5 34.8	7.88	0.365 4582	91.9	2.17	3.79	1 11.5
15	18 46 10.93	8.401	24 2 17.4	8.57	0.365 6771	90.5	2.17	3.79	1 10.9
16	18 49 32.56	+8.401	−23 58 43.6	+ 9.25	0.365 8927	+ 89.1	2.17	3.79	1 10.3
17	18 52 54.19	8.401	23 54 53.4	9.94	0.366 1050	87.7	2.17	3.79	1 9.8
18	18 56 15.80	8.400	23 50 46.7	10.62	0.366 3139	86.4	2.17	3.79	1 9.2
19	18 59 37.38	8.398	23 46 23.7	11.30	0.366 5196	85.0	2.17	3.78	1 8.6
20	19 2 58.92	8.396	23 41 44.3	11.98	0.366 7220	83.6	2.17	3.78	1 8.0
21	19 6 20.40	+8.393	−23 36 48.7	+12.66	0.366 9211	+ 82.3	2.17	3.78	1 7.4
22	19 9 41.80	8.390	23 31 36.8	13.33	0.367 1170	80.9	2.17	3.78	1 6.8
23	19 13 3.10	8.385	23 26 8.7	14.00	0.367 3095	79.5	2.17	3.78	1 6.2
24	19 16 24.29	8.380	23 20 24.6	14.67	0.367 4987	78.1	2.17	3.77	1 5.7
25	19 19 45.36	8.375	23 14 24.3	15.34	0.367 6846	76.7	2.17	3.77	1 5.1
26	19 23 6.28	+8.368	−23 8 8.1	+16.01	0.367 8671	+ 75.4	2.17	3.77	1 4.5
27	19 26 27.03	8.361	23 1 36.0	16.67	0.368 0465	74.1	2.16	3.77	1 3.9
28	19 29 47.60	8.353	22 54 48.1	17.32	0.368 2228	72.8	2.16	3.77	1 3.3
29	19 33 7.98	8.345	22 47 44.5	17.98	0.368 3961	71.6	2.16	3.77	1 2.7
30	19 36 28.14	8.335	22 40 25.2	18.62	0.368 5664	70.4	2.16	3.77	1 2.1
31	19 39 48.08	+8.326	−22 32 50.5	+19.27	0.368 7339	+ 69.2	2.16	3.77	1 1.5
32	19 43 7.78	. . . .	−22 25 0.4	. . . .	0.368 8986	. . . .	2.16	3.76	1 0.8

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		° ′ ″	′ ″	″	° ′ ″	″		
Jan.	1	122 26 13.2	27 1.9	+29.2	+1 46 28.0	+14.8	0.214 8775	+1834
	3	123 20 14.3	26 59.2	27.8	1 46 56.8	14.0	0.215 2394	1786
	5	124 14 10.1	26 56.6	26.4	1 47 24.0	13.2	0.215 5917	1738
	7	125 8 0.8	26 54.1	24.9	1 47 49.6	12.4	0.215 9344	1689
	9	126 1 46.5	26 51.6	23.4	1 48 13.6	11.6	0.216 2675	1641
	11	126 55 27.4	26 49.2	+21.8	+1 48 36.0	+10.8	0.216 5908	+1592
	13	127 49 3.5	26 46.9	20.3	1 48 56.8	10.0	0.216 9044	1543
	15	128 42 35.0	26 44.7	18.7	1 49 16.0	9.2	0.217 2081	1494
	17	129 36 2.2	26 42.5	17.2	1 49 33.5	8.4	0.217 5020	1445
	19	130 29 25.2	26 40.4	15.6	1 49 49.4	7.6	0.217 7860	1395
	21	131 22 44.0	26 38.4	+14.0	+1 50 3.7	+ 6.8	0.218 0602	+1346
	23	132 15 58.9	26 36.5	12.4	1 50 16.4	6.0	0.218 3243	1296
	25	133 9 10.0	26 34.7	10.7	1 50 27.6	5.2	0.218 5785	1246
	27	134 2 17.5	26 32.9	9.1	1 50 37.2	4.4	0.218 8227	1196
	29	134 55 21.5	26 31.2	7.4	1 50 45.1	3.6	0.219 0569	1146
	31	135 48 22.1	26 29.5	+ 5.8	+1 50 51.4	+ 2.8	0.219 2810	+1095
Feb.	2	136 41 19.5	26 28.0	4.2	1 50 56.2	2.0	0.219 4950	1045
	4	137 34 13.9	26 26.5	2.5	1 50 59.4	1.2	0.219 6989	994
	6	138 27 5.4	26 25.0	+ 0.9	1 51 1.0	+ 0.4	0.219 8926	943
	8	139 19 54.1	26 23.7	− 0.8	1 51 1.0	− 0.4	0.220 0761	892
	10	140 12 40.3	26 22.5	− 2.4	+1 50 59.4	− 1.2	0.220 2495	+ 841
	12	141 5 24.0	26 21.3	4.1	1 50 56.3	2.0	0.220 4126	790
	14	141 58 5.4	26 20.2	5.7	1 50 51.6	2.7	0.220 5655	739
	16	142 50 44.6	26 19.1	7.4	1 50 45.4	3.5	0.220 7081	688
	18	143 43 21.8	26 18.1	9.0	1 50 37.6	4.3	0.220 8405	636
	20	144 35 57.1	26 17.2	−10.6	+1 50 28.3	− 5.0	0.220 9626	+ 584
	22	145 28 30.7	26 16.4	12.2	1 50 17.5	5.8	0.221 0743	533
	24	146 21 2.8	26 15.7	13.8	1 50 5.0	6.6	0.221 1758	482
	26	147 13 33.5	26 15.0	15.4	1 49 51.1	7.4	0.221 2670	430
	28	148 6 2.9	26 14.4	17.0	1 49 35.6	8.1	0.221 3478	378
Mar.	1	148 58 31.2	26 13.9	−18.5	+1 49 18.7	− 8.9	0.221 4183	+ 327
	3	149 50 58.6	26 13.5	20.0	1 49 0.2	9.7	0.221 4785	275
	5	150 43 25.1	26 13.1	21.6	1 48 40.1	10.4	0.221 5282	223
	7	151 35 51.0	26 12.8	23.0	1 48 18.6	11.2	0.221 5677	171
	9	152 28 16.3	26 12.6	24.5	1 47 55.5	11.9	0.221 5967	119
	11	153 20 41.3	26 12.4	−26.0	+1 47 30.9	−12.7	0.221 6154	68
	13	154 13 6.1	26 12.4	27.4	1 47 4.9	13.4	0.221 6238	+ 16
	15	155 5 30.8	26 12.4	28.8	1 46 37.4	14.1	0.221 6217	− 36
	17	155 57 55.6	26 12.4	30.2	1 46 8.4	14.9	0.221 6093	88
	19	156 50 20.6	26 12.6	31.5	1 45 37.9	15.6	0.221 5865	140
	21	157 42 46.0	26 12.8	−32.8	+1 45 5.9	−16.4	0.221 5533	− 192
	23	158 35 11.9	26 13.1	34.1	1 44 32.4	17.1	0.221 5098	243
	25	159 27 38.5	26 13.5	35.4	1 43 57.5	17.8	0.221 4560	295
	27	160 20 5.9	26 14.0	36.6	1 43 21.2	18.5	0.221 3918	347
	29	161 12 34.3	26 14.5	37.8	1 42 43.4	19.3	0.221 3172	399
	31	162 5 3.9	26 15.1	−38.9	+1 42 4.1	−20.0	0.221 2323	− 450
Apr.	2	162 57 34.7	26 15.7	−40.0	+1 41 23.4	−20.7	0.221 1371	− 502

MARS, 1916.

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		° ′ ″	′ ″	″	° ′ ″	″		
r.	2	162 57 34.7	26 15.7	−40.0	+1 41 23.4	−20.7	0.221 1371	− 502
	4	163 50 6.9	26 16.5	41.1	1 40 41.2	21.4	0.221 0316	553
	6	164 42 40.6	26 17.3	42.2	1 39 57.6	22.2	0.220 9158	605
	8	165 35 16.1	26 18.2	43.2	1 39 12.6	22.9	0.220 7897	656
	10	166 27 53.5	26 19.2	44.1	1 38 26.1	23.6	0.220 6533	708
	12	167 20 32.9	26 20.2	−45.0	+1 37 38.3	−24.3	0.220 5067	− 759
	14	168 13 14.5	26 21.3	45.9	1 36 49.0	25.0	0.220 3498	810
	16	169 5 58.3	26 22.5	46.8	1 35 58.3	25.7	0.220 1827	861
	18	169 58 44.7	26 23.8	47.6	1 35 6.2	26.4	0.220 0053	912
	20	170 51 33.6	26 25.1	48.3	1 34 12.8	27.1	0.219 8178	963
	22	171 44 25.3	26 26.6	−49.0	+1 33 18.0	−27.8	0.219 6202	−1013
	24	172 37 19.9	26 28.1	49.7	1 32 21.8	28.5	0.219 4124	1064
	26	173 30 17.6	26 29.7	50.3	1 31 24.2	29.1	0.219 1945	1114
	28	174 23 18.6	26 31.3	50.8	1 30 25.2	29.8	0.218 9666	1165
	30	175 16 22.8	26 33.0	51.4	1 29 25.0	30.5	0.218 7286	1215
ay	2	176 9 30.7	26 34.8	−51.8	+1 28 23.3	−31.2	0.218 4805	−1265
	4	177 2 42.1	26 36.7	52.3	1 27 20.3	31.8	0.218 2225	1315
	6	177 55 57.4	26 38.6	52.6	1 26 15.9	32.5	0.217 9545	1365
	8	178 49 16.6	26 40.6	53.0	1 25 10.3	33.1	0.217 6765	1414
	10	179 42 40.0	26 42.8	53.2	1 24 3.3	33.8	0.217 3887	1464
	12	180 36 7.7	26 44.9	−53.4	+1 22 55.1	−34.5	0.217 0911	−1513
	14	181 29 39.7	26 47.2	53.6	1 21 45.4	35.1	0.216 7836	1562
	16	182 23 16.4	26 49.5	53.7	1 20 34.6	35.8	0.216 4664	1611
	18	183 16 57.7	26 51.9	53.8	1 19 22.4	36.4	0.216 1394	1659
	20	184 10 44.0	26 54.4	53.8	1 18 9.0	37.0	0.215 8028	1707
	22	185 4 35.3	26 56.9	−53.7	+1 16 54.3	−37.6	0.215 4565	−1756
	24	185 58 31.7	26 59.5	53.6	1 15 38.4	38.2	0.215 1006	1804
	26	186 52 33.5	27 2.2	53.5	1 14 21.3	38.9	0.214 7351	1851
	28	187 46 40.7	27 5.0	53.3	1 13 2.8	39.5	0.214 3601	1898
	30	188 40 53.5	27 7.9	53.0	1 11 43.2	40.1	0.213 9757	1945
une	1	189 35 12.2	27 10.8	−52.7	+1 10 22.3	−40.7	0.213 5820	−1992
	3	190 29 36.7	27 13.8	52.4	1 9 0.2	41.3	0.213 1788	2039
	5	191 24 7.4	27 16.9	52.0	1 7 37.0	41.9	0.212 7665	2085
	7	192 18 44.3	27 20.0	51.6	1 6 12.5	42.5	0.212 3449	2131
	9	193 13 27.6	27 23.3	51.1	1 4 46.9	43.1	0.211 9141	2177
	11	194 8 17.4	27 26.6	−50.5	+1 3 20.1	−43.7	0.211 4743	−2222
	13	195 3 13.9	27 30.0	49.8	1 1 52.2	44.2	0.211 0255	2266
	15	195 58 17.2	27 33.4	49.1	1 0 23.1	44.8	0.210 5678	2311
	17	196 53 27.5	27 37.0	48.4	0 58 52.9	45.4	0.210 1011	2355
	19	197 48 45.0	27 40.6	47.6	0 57 21.7	45.9	0.209 6257	2399
	21	198 44 9.8	27 44.2	−46.8	+0 55 49.3	−46.5	0.209 1416	−2442
	23	199 39 42.0	27 48.0	45.9	0 54 15.9	47.0	0.208 6488	2485
	25	200 35 21.8	27 51.8	44.9	0 52 41.3	47.5	0.208 1474	2528
	27	201 31 9.3	27 55.7	43.9	0 51 5.7	48.1	0.207 6376	2570
	29	202 27 4.7	27 59.7	42.9	0 49 29.1	48.6	0.207 1193	2612
ly	1	203 23 8.1	28 3.8	−41.8	+0 47 51.5	−49.1	0.206 5928	−2653
	3	204 19 19.7	28 7.9	−40.7	+0 46 12.8	−49.6	0.206 0581	−2694

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		° ′ ″	′ ″	″	° ′ ″	″		
July	1	203 23 8.1	28 3.8	−41.8	+0 47 51.5	−49.1	0.206 5928	−2653
	3	204 19 19.7	28 7.9	40.7	0 46 12.8	49.6	0.206 0581	2694
	5	205 15 39.6	28 12 1	39.5	0 44 33.2	50.0	0.205 5152	2734
	7	206 12 8.1	28 16.4	38.3	0 42 52.6	50.5	0.204 9643	2774
	9	207 8 45.1	28 20.7	37.0	0 41 11.1	51.0	0.204 4055	2813
	11	208 5 30.9	28 25.1	−35.7	+0 39 28.6	−51.5	0.203 8390	−2852
	13	209 2 25.6	28 29.6	34.4	0 37 45.2	51.9	0.203 2647	2890
	15	209 59 29.4	28 34.2	33.0	0 36 0.9	52.4	0.202 6828	2928
	17	210 56 42.4	28 38.8	31.6	0 34 15.7	52.8	0.202 0935	2965
	19	211 54 4.7	28 43.5	30.1	0 32 29.7	53.2	0.201 4968	3002
	21	212 51 36.5	28 48.3	−28.6	+0 30 42.8	−53.6	0.200 8928	−3038
	23	213 49 18.0	28 53.2	27.0	0 28 55.1	54.0	0.200 2818	3073
	25	214 47 9.3	28 58.1	25.5	0 27 6.6	54.4	0.199 6637	3108
	27	215 45 10.4	29 3.1	23.9	0 25 17.3	54.8	0.199 0387	3142
	29	216 43 21.7	29 8.2	22.2	0 23 27.3	55.2	0.198 4070	3175
	31	217 41 43.1	29 13.3	−20.5	+0 21 36.6	−55.6	0.197 7688	−3208
Aug.	2	218 40 14.9	29 18.5	18.8	0 19 45.1	55.9	0.197 1240	3240
	4	219 38 57.2	29 23.8	17.1	0 17 52.9	56.2	0.196 4730	3271
	6	220 37 50.0	29 29.1	15.3	0 16 0.1	56.5	0.195 8158	3301
	8	221 36 53.5	29 34.5	13.6	0 14 6.7	56.8	0.195 1527	3330
	10	222 36 8.0	29 40.0	−11.8	+0 12 12.7	−57.1	0.194 4836	−3360
	12	223 35 33.4	29 45.5	9.9	0 10 18.1	57.4	0.193 8089	3388
	14	224 35 10.0	29 51.1	8.1	0 8 22.9	57.7	0.193 1286	3415
	16	225 34 57.9	29 56.7	6.2	0 6 27.3	57.9	0.192 4429	3442
	18	226 34 57.0	30 2.5	4.4	0 4 31.2	58.2	0.191 7520	3467
	20	227 35 7.8	30 8.3	− 2.5	+0 2 34.6	−58.4	0.191 0561	−3492
	22	228 35 30.1	30 14.1	− 0.6	+0 0 37.6	58.6	0.190 3554	3515
	24	229 36 4.1	30 20.0	+ 1.3	−0 1 19.8	58.8	0.189 6500	3538
	26	230 36 50.1	30 26.0	3.2	0 3 17.6	59.0	0.188 9401	3560
	28	231 37 48.0	30 32.0	5.1	0 5 15.7	59.1	0.188 2260	3581
	30	232 38 57.9	30 38.0	+ 7.0	−0 7 14.0	−59.2	0.187 5078	−3601
Sept.	1	233 40 20.1	30 44.2	8.9	0 9 12.7	59.4	0.186 7857	3620
	3	234 41 54.6	30 50.4	10.8	0 11 11.5	59.5	0.186 0599	3638
	5	235 43 41.5	30 56.6	12.7	0 13 10.5	59.6	0.185 3306	3655
	7	236 45 40.9	31 2.8	14.5	0 15 9.7	59.6	0.184 5981	3670
	9	237 47 52.9	31 9.2	+16.4	−0 17 9.0	−59.6	0.183 8625	−3685
	11	238 50 17.6	31 15.6	18.3	0 19 8.3	59.6	0.183 1242	3698
	13	239 52 55.1	31 22.0	20.1	0 21 7.6	59.7	0.182 3832	3711
	15	240 55 45.5	31 28.4	21.9	0 23 7.0	59.7	0.181 6398	3722
	17	241 58 48.9	31 35.0	23.7	0 25 6.3	59.6	0.180 8943	3732
	19	243 2 5.4	31 41.5	+25.4	−0 27 5.4	−59.6	0.180 1470	−3741
	21	244 5 35.0	31 48.1	27.2	0 29 4.5	59.5	0.179 3980	3748
	23	245 9 17.8	31 54.7	28.9	0 31 3.4	59.4	0.178 6476	3755
	25	246 13 13.8	32 1.4	30.6	0 33 2.0	59.2	0.177 8961	3760
	27	247 17 23.2	32 8.1	32.2	0 35 0.4	59.1	0.177 1437	3764
	29	248 21 46.1	32 14.8	+33.8	−0 36 58.5	−58.9	0.176 3907	−3766
Oct.	1	249 26 22.3	32 21.5	+35.3	−0 38 56.1	−58.7	0.175 6373	−3767

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		° ′ ″	′ ″	″	° ′ ″	″		
ct.	1	249 26 22.3	32 21.5	+35.3	−0 38 56.1	−58.7	0.175 6373	−3767
	3	250 31 12.1	32 28.3	36.8	0 40 53.4	58.5	0.174 8839	3766
	5	251 36 15.5	32 35.1	38.3	0 42 50.1	58.2	0.174 1307	3765
	7	252 41 32.5	32 41.9	39.7	0 44 46.4	58.0	0.173 3780	3762
	9	253 47 3.1	32 48.7	41.0	0 46 42.0	57.7	0.172 6260	3758
	11	254 52 47.4	32 55.6	+42.3	−0 48 37.1	−57.4	0.171 8750	−3752
	13	255 58 45.4	33 2.4	43.6	0 50 31.5	57.0	0.171 1254	3744
	15	257 4 57.2	33 9.3	44.8	0 52 25.1	56.6	0.170 3775	3735
	17	258 11 22.7	33 16.2	45.9	0 54 18.0	56.2	0.169 6314	3725
	19	259 18 2.0	33 23.1	46.9	0 56 10.1	55.8	0.168 8876	3713
	21	260 24 55.1	33 30.0	+47.9	−0 58 1.3	−55.3	0.168 1463	−3699
	23	261 32 1.9	33 36.8	48.8	0 59 51.5	54.8	0.167 4079	3684
	25	262 39 22.5	33 43.7	49.7	1 1 40.7	54.3	0.166 6726	3668
	27	263 46 56.8	33 50.6	50.4	1 3 28.8	53.8	0.165 9409	3649
	29	264 54 44.7	33 57.4	51.2	1 5 15.9	53.2	0.165 2129	3629
	31	266 2 46.5	34 4.3	+51.8	−1 7 1.8	−52.6	0.164 4891	−3608
Nov.	2	267 11 1.8	34 11.1	52.3	1 8 46.4	52.0	0.163 7697	3585
	4	268 19 30.9	34 17.9	52.8	1 10 29.8	51.4	0.163 0550	3560
	6	269 28 13.5	34 24.7	53.1	1 12 11.8	50.7	0.162 3455	3534
	8	270 37 9.6	34 31.4	53.4	1 13 52.4	49.9	0.161 6414	3506
	10	271 46 19.2	34 38.1	+53.6	−1 15 31.5	−49.2	0.160 9431	−3476
	12	272 55 42.1	34 44.8	53.8	1 17 9.1	48.4	0.160 2509	3445
	14	274 5 18.5	34 51.5	53.8	1 18 45.1	47.6	0.159 5651	3412
	16	275 15 8.0	34 58.0	53.7	1 20 19.5	46.8	0.158 8861	3377
	18	276 25 10.6	35 4.6	53.6	1 21 52.2	45.9	0.158 2142	3341
	20	277 35 26.3	35 11.1	+53.4	−1 23 23.1	−45.0	0.157 5498	−3302
	22	278 45 54.9	35 17.5	53.0	1 24 52.2	44.1	0.156 8932	3263
	24	279 56 36.4	35 23.9	52.6	1 26 19.5	43.1	0.156 2447	3221
	26	281 7 30.5	35 30.2	52.1	1 27 44.7	42.1	0.155 6048	3178
	28	282 18 37.2	35 36.4	51.5	1 29 8.0	41.1	0.154 9736	3133
	30	283 29 56.3	35 42.6	+50.8	−1 30 29.2	−40.1	0.154 3515	−3086
Dec.	2	284 41 27.7	35 48.7	50.0	1 31 48.3	39.0	0.153 7390	3038
	4	285 53 11.1	35 54.7	49.2	1 33 5.2	37.9	0.153 1363	2988
	6	287 5 6.6	36 0.6	48.2	1 34 19.9	36.8	0.152 5438	2936
	8	288 17 13.7	36 6.5	47.2	1 35 32.4	35.6	0.151 9617	2883
	10	289 29 32.5	36 12.3	+46.0	−1 36 42.5	−34.4	0.151 3905	−2828
	12	290 42 2.7	36 17.9	44.8	1 37 50.2	33.2	0.150 8305	2771
	14	291 54 44.1	36 23.4	43.5	1 38 55.4	32.0	0.150 2820	2713
	16	293 7 36.4	36 28.9	42.1	1 39 58.2	30.8	0.149 7452	2653
	18	294 20 39.6	36 34.2	40.7	1 40 58.4	29.5	0.149 2206	2592
	20	295 33 53.3	36 39.4	+39.1	−1 41 56.0	−28.1	0.148 7084	−2529
	22	296 47 17.3	36 44.5	37.5	1 42 50.9	26.8	0.148 2089	2465
	24	298 0 51.3	36 49.5	35.9	1 43 43.2	25.4	0.147 7225	2399
	26	299 14 35.2	36 54.4	34.1	1 44 32.7	24.0	0.147 2494	2331
	28	300 28 28.7	36 59.1	32.3	1 45 19.4	22.6	0.146 7900	2262
	30	301 42 31.6	37 3.7	+30.4	−1 46 3.3	−21.2	0.146 3445	−2192
	32	302 56 43.4	37 8.1	+28.5	−1 46 44.3	−19.8	0.145 9131	−2120

JUPITER, 1916.

GREENWICH MEAN TIME.

Date.		Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
		Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
		h m s	s	° ′ ″	″			″	″	h m
Jan.	1	23 33 35.59	+1.317	−4 12 53.6	+ 9.04	0.712 7957	+530.3	18.23	1.70	4 53.6
	2	23 34 7.45	1.338	4 9 14.8	9.18	0.714 0635	526.2	18.18	1.70	4 50.2
	3	23 34 39.83	1.360	4 5 32.8	9.32	0.715 3214	522.1	18.13	1.70	4 46.8
	4	23 35 12.73	1.381	4 1 47.5	9.45	0.716 5693	517.8	18.08	1.69	4 43.4
	5	23 35 46.13	1.402	3 57 59.0	9.59	0.717 8069	513.5	18.03	1.69	4 40.1
	6	23 36 20.03	+1.423	−3 54 7.3	+ 9.72	0.719 0340	+509.1	17.98	1.68	4 36.7
	7	23 36 54.42	1.443	3 50 12.6	9.84	0.720 2504	504.6	17.92	1.68	4 33.3
	8	23 37 29.29	1.463	3 46 14.8	9.97	0.721 4558	499.9	17.87	1.67	4 30.0
	9	23 38 4.64	1.483	3 42 13.9	10.10	0.722 6500	495.2	17.82	1.67	4 26.6
	10	23 38 40.45	1.502	3 38 10.1	10.22	0.723 8330	490.5	17.78	1.66	4 23.3
	11	23 39 16.72	+1.521	−3 34 3.5	+10.34	0.725 0046	+485.8	17.73	1.66	4 20.0
	12	23 39 53.44	1.539	3 29 54.0	10.45	0.726 1646	480.9	17.68	1.65	4 16.7
	13	23 40 30.61	1.558	3 25 41.7	10.57	0.727 3129	476.0	17.63	1.65	4 13.3
	14	23 41 8.21	1.575	3 21 26.7	10.68	0.728 4494	471.1	17.59	1.65	4 10.0
	15	23 41 46.23	1.593	3 17 9.0	10.79	0.729 5740	466.1	17.54	1.64	4 6.7
	16	23 42 24.67	+1.610	−3 12 48.6	+10.90	0.730 6865	+461.0	17.50	1.64	4 3.4
	17	23 43 3.53	1.628	3 8 25.6	11.01	0.731 7868	455.9	17.45	1.63	4 0.2
	18	23 43 42.79	1.644	3 4 0.1	11.11	0.732 8749	450.8	17.41	1.63	3 56.9
	19	23 44 22.45	1.661	2 59 32.1	11.22	0.733 9506	445.6	17.37	1.62	3 53.6
	20	23 45 2.50	1.677	2 55 1.6	11.32	0.735 0139	440.4	17.32	1.62	3 50.3
	21	23 45 42.95	+1.693	−2 50 28.6	+11.43	0.736 0646	+435.2	17.28	1.62	3 47.1
	22	23 46 23.77	1.709	2 45 53.2	11.52	0.737 1027	429.9	17.24	1.61	3 43.8
	23	23 47 4.96	1.724	2 41 15.5	11.62	0.738 1281	424.6	17.20	1.61	3 40.6
	24	23 47 46.52	1.739	2 36 35.5	11.71	0.739 1407	419.2	17.16	1.60	3 37.3
	25	23 48 28.45	1.754	2 31 53.2	11.81	0.740 1404	413.8	17.12	1.60	3 34.1
	26	23 49 10.73	+1.769	−2 27 8.7	+11.90	0.741 1270	+408.4	17.08	1.60	3 30.9
	27	23 49 53.36	1.784	2 22 22.0	11.99	0.742 1006	402.9	17.04	1.59	3 27.6
	28	23 50 36.34	1.798	2 17 33.1	12.08	0.743 0610	397.4	17.01	1.59	3 24.4
	29	23 51 19.65	1.812	2 12 42.1	12.17	0.744 0081	391.8	16.97	1.59	3 21.2
	30	23 52 3.30	1.825	2 7 49.0	12.25	0.744 9418	386.2	16.93	1.58	3 18.0
	31	23 52 47.27	+1.839	−2 2 53.9	+12.34	0.745 8619	+380.6	16.90	1.58	3 14.8
Feb.	1	23 53 31.57	1.852	1 57 56.7	12.42	0.746 7685	374.9	16.86	1.58	3 11.6
	2	23 54 16.18	1.865	1 52 57.6	12.50	0.747 6613	369.1	16.83	1.57	3 8.4
	3	23 55 1.10	1.878	1 47 56.7	12.58	0.748 5403	363.4	16.79	1.57	3 5.2
	4	23 55 46.32	1.890	1 42 53.9	12.65	0.749 4055	357.6	16.76	1.57	3 2.1
	5	23 56 31.84	+1.903	−1 37 49.4	+12.73	0.750 2536	+351.7	16.73	1.56	2 58.9
	6	23 57 17.64	1.914	1 32 43.1	12.80	0.751 0936	345.8	16.70	1.56	2 55.7
	7	23 58 3.72	1.926	1 27 35.2	12.87	0.751 9164	339.9	16.66	1.56	2 52.5
	8	23 58 50.08	1.937	1 22 25.5	12.94	0.752 7250	334.0	16.63	1.55	2 49.4
	9	23 59 36.71	1.948	1 17 14.2	13.00	0.753 5195	328.1	16.60	1.55	2 46.2
	10	0 0 23.59	+1.959	−1 12 1.4	+13.07	0.754 2996	+322.1	16.57	1.55	2 43.1
	11	0 1 10.74	1.970	1 6 47.0	13.13	0.755 0655	316.2	16.54	1.55	2 39.9
	12	0 1 58.13	1.980	1 1 31.1	13.19	0.755 8171	310.2	16.51	1.54	2 36.8
	13	0 2 45.77	1.990	0 56 13.8	13.25	0.756 5543	304.2	16.49	1.54	2 33.6
	14	0 3 33.64	1.999	0 50 55.2	13.30	0.757 2772	298.2	16.46	1.54	2 30.5
	15	0 4 21.74	+2.009	−0 45 35.2	+13.36	0.757 9857	+292.2	16.43	1.54	2 27.4
	16	*0 5 10.07*	*+2.018*	−0 40 13.9	+13.41	0.758 6797	+286.2	16.41	1.53	2 24.2

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h m
eb. 16	0 5 10.07	+2.018	−0 40 13.9	+13.41	0.758 6797	+286.2	16.41	1.53	2 24.2
17	0 5 58.62	2.027	0 34 51.4	13.46	0.759 3593	280.1	16.38	1.53	2 21.1
18	0 6 47.38	2.036	0 29 27.6	13.52	0.760 0244	274.1	16.36	1.53	2 18.0
19	0 7 36.36	2.045	0 24 2.6	13.56	0.760 6751	268.1	16.33	1.53	2 14.9
20	0 8 25.54	2.053	0 18 36.5	13.61	0.761 3113	262.1	16.31	1.53	2 11.8
21	0 9 14.92	+2.062	−0 13 9.3	+13.66	0.761 9330	+256.0	16.28	1.52	2 8.6
22	0 10 4.50	2.070	0 7 41.0	13.70	0.762 5402	250.0	16.26	1.52	2 5.5
23	0 10 54.27	2.078	−0 2 11.6	13.75	0.763 1329	243.9	16.24	1.52	2 2.4
24	0 11 44.23	2.085	+0 3 18.8	13.79	0.763 7109	237.8	16.22	1.52	1 59.3
25	0 12 34.37	2.093	0 8 50.1	13.83	0.764 2744	231.8	16.20	1.52	1 56.2
26	0 13 24.69	+2.100	+0 14 22.4	+13.86	0.764 8233	+225.6	16.18	1.51	1 53.1
27	0 14 15.19	2.108	0 19 55.6	13.90	0.765 3575	219.5	16.16	1.51	1 50.0
28	0 15 5.85	2.114	0 25 29.7	13.94	0.765 8769	213.4	16.14	1.51	1 46.9
29	0 15 56.68	2.121	0 31 4.6	13.97	0.766 3816	207.2	16.12	1.51	1 43.9
ar. 1	0 16 47.67	2.128	0 36 40.3	14.00	0.766 8715	201.1	16.10	1.51	1 40.8
2	0 17 38.81	+2.134	+0 42 16.8	+14.03	0.767 3466	+194.8	16.08	1.50	1 37.7
3	0 18 30.10	2.140	0 47 53.9	14.06	0.767 8067	188.6	16.06	1.50	1 34.6
4	0 19 21.54	2.146	0 53 31.7	14.09	0.768 2518	182.4	16.05	1.50	1 31.5
5	0 20 13.11	2.151	0 59 10.1	14.11	0.768 6820	176.1	16.03	1.50	1 28.4
6	0 21 4.81	2.157	1 4 49.1	14.13	0.769 0972	169.9	16.02	1.50	1 25.4
7	0 21 56.64	+2.162	+1 10 28.5	+14.15	0.769 4974	+163.6	16.00	1.50	1 22.3
8	0 22 48.59	2.167	1 16 8.5	14.18	0.769 8827	157.4	15.99	1.50	1 19.2
9	0 23 40.65	2.172	1 21 48.9	14.19	0.770 2530	151.2	15.97	1.49	1 16.2
10	0 24 32.83	2.176	1 27 29.7	14.21	0.770 6084	145.0	15.96	1.49	1 13.1
11	0 25 25.11	2.180	1 33 10.8	14.22	0.770 9489	138.8	15.95	1.49	1 10.0
12	0 26 17.49	+2.185	+1 38 52.3	+14.23	0.771 2744	+132.5	15.94	1.49	1 7.0
13	0 27 9.97	2.189	1 44 34.0	14.24	0.771 5850	126.3	15.92	1.49	1 3.9
14	0 28 2.54	2.192	1 50 16.0	14.26	0.771 8807	120.1	15.91	1.49	1 0.8
15	0 28 55.20	2.196	1 55 58.3	14.26	0.772 1616	113.9	15.90	1.49	0 57.8
16	0 29 47.94	2.199	2 1 40.7	14.27	0.772 4276	107.8	15.89	1.49	0 54.7
17	0 30 40.76	+2.202	+2 7 23.2	+14.28	0.772 6789	+101.6	15.88	1.49	0 51.7
18	0 31 33.65	2.205	2 13 5.9	14.28	0.772 9153	95.4	15.88	1.49	0 48.6
19	0 32 26.61	2.208	2 18 48.6	14.28	0.773 1370	89.3	15.87	1.48	0 45.6
20	0 33 19.64	2.211	2 24 31.4	14.28	0.773 3439	83.1	15.86	1.48	0 42.5
21	0 34 12.73	2.213	2 30 14.2	14.28	0.773 5361	77.0	15.85	1.48	0 39.5
22	0 35 5.88	+2.216	+2 35 57.0	+14.28	0.773 7136	+ 70.9	15.85	1.48	0 36.4
23	0 35 59.08	2.218	2 41 39.8	14.28	0.773 8763	64.7	15.84	1.48	0 33.4
24	0 36 52.34	2.220	2 47 22.5	14.28	0.774 0243	58.6	15.84	1.48	0 30.3
25	0 37 45.65	2.222	2 53 5.1	14.27	0.774 1575	52.4	15.83	1.48	0 27.3
26	0 38 39.00	2.224	2 58 47.5	14.26	0.774 2759	46.3	15.83	1.48	0 24.2
27	0 39 32.39	+2.225	+3 4 29.8	+14.26	0.774 3796	+ 40.1	15.82	1.48	0 21.2
28	0 40 25.82	2.227	3 10 11.9	14.25	0.774 4685	33.9	15.82	1.48	0 18.1
29	0 41 19.28	2.228	3 15 53.8	14.24	0.774 5425	27.7	15.82	1.48	0 15.1
30	0 42 12.77	2.229	3 21 35.4	14.23	0.774 6016	21.5	15.82	1.48	0 12.0
31	0 43 6.28	2.230	3 27 16.6	14.21	0.774 6459	15.3	15.81	1.48	0 9.0
Apr. 1	0 43 59.81	+2.231	+3 32 57.5	+14.20	0.774 6752	+ 9.1	15.81	1.48	0 5.9
2	0 44 53.35	+2.231	+3 38 38.0	+14.18	0.774 6897	+ 2.9	15.81	1.48	0 2.9

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h m
Apr. 1	0 43 59.81	+2.231	+3 32 57.5	+14.20	0.774 6752	+ 9.1	15.81	1.48	0 5.9
2	0 44 53.35	2.231	3 38 38.0	14.18	0.774 6897	+ 2.9	15.81	1.48	0 2.9 23 59.9
3	0 45 46.91	2.231	3 44 18.0	14.16	0.774 6893	− 3.3	15.81	1.48	23 56.8
4	0 46 40.46	2.231	3 49 57.6	14.14	0.774 6741	9.4	15.81	1.48	23 53.8
5	0 47 34.01	2.231	3 55 36.7	14.12	0.774 6441	15.6	15.81	1.48	23 50.7
6	0 48 27.55	+2.231	+4 1 15.2	+14.09	0.774 5994	− 21.7	15.82	1.48	23 47.7
7	0 49 21.09	2.230	4 6 53.1	14.07	0.774 5399	27.8	15.82	1.48	23 44.6
8	0 50 14.60	2.229	4 12 30.5	14.04	0.774 4658	33.9	15.82	1.48	23 41.6
9	0 51 8.10	2.229	4 18 7.2	14.01	0.774 3770	40.1	15.82	1.48	23 38.5
10	0 52 1.57	2.227	4 23 43.1	13.98	0.774 2735	46.2	15.83	1.48	23 35.5
11	0 52 55.01	+2.226	+4 29 18.4	+13.95	0.774 1554	− 52.3	15.83	1.48	23 32.4
12	0 53 48.41	2.224	4 34 52.9	13.92	0.774 0227	58.3	15.84	1.48	23 29.4
13	0 54 41.78	2.223	4 40 26.6	13.89	0.773 8755	64.4	15.84	1.48	23 26.3
14	0 55 35.12	2.221	4 45 59.6	13.86	0.773 7138	70.4	15.85	1.48	23 23.3
15	0 56 28.41	2.219	4 51 31.7	13.82	0.773 5377	76.4	15.85	1.48	23 20.2
16	0 57 21.64	+2.217	+4 57 2.9	+13.78	0.773 3472	− 82.4	15.86	1.48	23 17.2
17	0 58 14.82	2.215	5 2 33.3	13.75	0.773 1423	88.4	15.87	1.48	23 14.1
18	0 59 7.95	2.213	5 8 2.8	13.71	0.772 9231	94.3	15.88	1.49	23 11.1
19	1 0 1.02	2.210	5 13 31.3	13.67	0.772 6896	100.3	15.89	1.49	23 8.0
20	1 0 54.03	2.207	5 18 58.8	13.63	0.772 4418	106.2	15.90	1.49	23 5.0
21	1 1 46.97	+2.205	+5 24 25.4	+13.59	0.772 1797	−112.2	15.90	1.49	23 1.9
22	1 2 39.85	2.201	5 29 51.0	13.54	0.771 9032	118.2	15.92	1.49	22 58.9
23	1 3 32.64	2.198	5 35 15.5	13.50	0.771 6125	124.1	15.93	1.49	22 55.8
24	1 4 25.36	2.195	5 40 38.9	13.45	0.771 3074	130.1	15.94	1.49	22 52.8
25	1 5 18.00	2.191	5 46 1.2	13.41	0.770 9880	136.1	15.95	1.49	22 49.7
26	1 6 10.55	+2.188	+5 51 22.4	+13.36	0.770 6543	−142.0	15.95	1.49	22 46.6
27	1 7 3.01	2.184	5 56 42.5	13.31	0.770 3063	148.0	15.97	1.49	22 43.6
28	1 7 55.38	2.180	6 2 1.3	13.26	0.769 9440	153.9	15.99	1.50	22 40.5
29	1 8 47.64	2.175	6 7 18.8	13.20	0.769 5674	159.9	16.00	1.50	22 37.4
30	1 9 39.80	2.171	6 12 35.1	13.15	0.769 1765	165.8	16.01	1.50	22 34.4
May 1	1 10 31.85	+2.166	+6 17 50.1	+13.10	0.768 7713	−171.8	16.03	1.50	22 31.3
2	1 11 23.78	2.161	6 23 3.7	13.04	0.768 3520	177.7	16.04	1.50	22 28.2
3	1 12 15.59	2.156	6 28 15.9	12.98	0.767 9184	183.6	16.06	1.50	22 25.2
4	1 13 7.27	2.151	6 33 26.7	12.92	0.767 4706	189.5	16.08	1.50	22 22.1
5	1 13 58.82	2.145	6 38 36.1	12.86	0.767 0088	195.3	16.09	1.50	22 19.0
6	1 14 50.24	+2.139	+6 43 44.0	+12.80	0.766 5330	−201.1	16.11	1.51	22 15.9
7	1 15 41.51	2.133	6 48 50.4	12.74	0.766 0433	207.0	16.13	1.51	22 12.8
8	1 16 32.34	2.127	6 53 55.3	12.67	0.765 5396	212.8	16.15	1.51	22 9.8
9	1 17 23.62	2.121	6 58 58.6	12.60	0.765 0221	218.5	16.17	1.51	22 6.7
10	1 18 14.44	2.114	7 4 0.3	12.54	0.764 4908	224.3	16.19	1.51	22 3.6
11	1 19 5.10	+2.108	+7 9 0.4	+12.47	0.763 9457	−230.0	16.21	1.52	22 0.5
12	1 19 55.60	2.101	7 13 58.9	12.40	0.763 3869	235.7	16.23	1.52	21 57.4
13	1 20 45.93	2.093	7 18 55.7	12.33	0.762 8144	241.4	16.25	1.52	21 54.3
14	1 21 36.08	2.086	7 23 50.8	12.26	0.762 2284	247.0	16.27	1.52	21 51.2
15	1 22 26.06	2.079	7 28 44.2	12.19	0.761 6289	252.6	16.30	1.52	21 48.1
16	1 23 15.86	+2.071	+7 33 35.8	+12.11	0.761 0159	−258.2	16.32	1.53	21 45.0
17	*1 24* 5.48	+2.063	+7 38 25.7	+12.04	0.760 3894	−263.8	16.34	1.53	21 41.9

Date.		Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semidiameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
		Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	
		h m s	s	° ′ ″	″			″	″	h m
May	17	1 24 5.48	+2.063	+ 7 38 25.7	+12.04	0.760 3894	−263.8	16.34	1.53	21 41.9
	18	1 24 54.90	2.055	7 43 13.9	11.97	0.759 7495	269.4	16.36	1.53	21 38.7
	19	1 25 44.13	2.047	7 48 0.3	11.89	0.759 0961	275.0	16.39	1.53	21 35.6
	20	1 26 33.17	2.039	7 52 44.8	11.82	0.758 4294	280.6	16.42	1.53	21 32.5
	21	1 27 22.00	2.030	7 57 27.5	11.74	0.757 7493	286.1	16.44	1.54	21 29.4
	22	1 28 10.63	+2.022	+ 8 2 8.3	+11.66	0.757 0559	−291.7	16.47	1.54	21 26.2
	23	1 28 59.05	2.013	8 6 47.2	11.58	0.756 3492	297.2	16.49	1.54	21 23.1
	24	1 29 47.25	2.004	8 11 24.2	11.50	0.755 6293	302.8	16.52	1.55	21 20.0
	25	1 30 35.22	1.994	8 15 59.1	11.41	0.754 8960	308.3	16.55	1.55	21 16.8
	26	1 31 22.96	1.984	8 20 32.1	11.33	0.754 1495	313.8	16.58	1.55	21 13.7
	27	1 32 10.47	+1.975	+ 8 25 3.1	+11.25	0.753 3897	−319.3	16.61	1.55	21 10.6
	28	1 32 57.75	1.965	8 29 31.9	11.16	0.752 6168	324.8	16.64	1.56	21 7.4
	29	1 33 44.77	1.954	8 33 58.7	11.07	0.751 8308	330.2	16.67	1.56	21 4.2
	30	1 34 31.54	1.943	8 38 23.4	10.98	0.751 0317	335.6	16.70	1.56	21 1.1
	31	1 35 18.05	1.933	8 42 45.9	10.89	0.750 2197	341.0	16.73	1.56	20 57.9
June	1	1 36 4.30	+1.921	+ 8 47 6.2	+10.80	0.749 3947	−346.4	16.76	1.57	20 54.8
	2	1 36 50.27	1.910	8 51 24.3	10.71	0.748 5570	351.7	16.79	1.57	20 51.6
	3	1 37 35.97	1.898	8 55 40.2	10.61	0.747 7065	357.0	16.83	1.57	20 48.4
	4	1 38 21.39	1.886	8 59 53.8	10.52	0.746 8434	362.2	16.86	1.58	20 45.2
	5	1 39 6.51	1.874	9 4 5.1	10.42	0.745 9678	367.4	16.89	1.58	20 42.0
	6	1 39 51.34	+1.862	+ 9 8 14.1	+10.33	0.745 0797	−372.6	16.93	1.58	20 38.9
	7	1 40 35.87	1.849	9 12 20.7	10.23	0.744 1793	377.7	16.96	1.59	20 35.7
	8	1 41 20.10	1.836	9 16 25.0	10.13	0.743 2666	382.8	17.00	1.59	20 32.5
	9	1 42 4.02	1.823	9 20 26.9	10.03	0.742 3417	387.9	17.03	1.59	20 29.2
	10	1 42 47.62	1.810	9 24 26.4	9.93	0.741 4047	392.9	17.07	1.60	20 26.0
	11	1 43 30.89	+1.796	+ 9 28 23.4	+ 9.83	0.740 4557	−397.9	17.11	1.60	20 22.8
	12	1 44 13.84	1.783	9 32 18.0	9.72	0.739 4948	402.8	17.15	1.60	20 19.6
	13	1 44 56.45	1.769	9 36 10.1	9.62	0.738 5221	407.7	17.19	1.61	20 16.3
	14	1 45 38.73	1.754	9 39 59.7	9.51	0.737 5377	412.6	17.22	1.61	20 13.1
	15	1 46 20.66	1.740	9 43 46.8	9.41	0.736 5416	417.5	17.26	1.61	20 9.9
	16	1 47 2.25	+1.725	+ 9 47 31.4	+ 9.30	0.735 5339	−422.3	17.30	1.62	20 6.6
	17	1 47 43.48	1.710	9 51 13.4	9.19	0.734 5147	427.0	17.34	1.62	20 3.4
	18	1 48 24.35	1.695	9 54 52.9	9.09	0.733 4841	431.8	17.39	1.63	20 0.1
	19	1 49 4.86	1.680	9 58 29.7	8.98	0.732 4422	436.5	17.43	1.63	19 56.8
	20	1 49 45.00	1.665	10 2 3.9	8.87	0.731 3889	441.2	17.47	1.63	19 53.6
	21	1 50 24.76	+1.649	+10 5 35.4	+ 8.76	0.730 3245	−445.8	17.51	1.64	19 50.3
	22	1 51 4.13	1.632	10 9 4.2	8.64	0.729 2489	450.5	17.56	1.64	19 47.0
	23	1 51 43.11	1.616	10 12 30.3	8.53	0.728 1622	455.1	17.60	1.65	19 43.7
	24	1 52 21.69	1.599	10 15 53.6	8.41	0.727 0644	459.7	17.64	1.65	19 40.4
	25	1 52 59.86	1.582	10 19 14.2	8.30	0.725 9558	464.1	17.69	1.65	19 37.1
	26	1 53 37.61	+1.564	+10 22 31.9	+ 8.18	0.724 8365	−468.6	17.74	1.66	19 33.8
	27	1 54 14.94	1.546	10 25 46.8	8.06	0.723 7066	472.9	17.78	1.66	19 30.5
	28	1 54 51.84	1.528	10 28 58.8	7.94	0.722 5664	477.2	17.83	1.67	19 27.2
	29	1 55 28.29	1.510	10 32 7.9	7.82	0.721 4159	481.5	17.88	1.67	19 23.8
	30	1 56 4.31	1.491	10 35 14.1	7.70	0.720 2552	485.7	17.92	1.68	19 20.5
July	1	1 56 39.87	+1.472	+10 38 17.3	+ 7.57	0.719 0845	−489.8	17.97	1.68	19 17.1
	2	1 57 14.98	+1.453	+10 41 17.6	+ 7.45	0.717 9040	−493.9	18.02	1.69	19 13.8

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″			″	″	h m
July 1	1 56 39.87	+1.472	+10 38 17.3	+7.57	0.719 0845	−489.8	17.97	1.68	19 17.1
2	1 57 14.98	1.453	10 41 17.6	7.45	0.717 9040	493.9	18.02	1.69	19 13.8
3	1 57 49.62	1.434	10 44 14.8	7.32	0.716 7138	497.9	18.07	1.69	19 10.4
4	1 58 23.79	1.414	10 47 9.1	7.20	0.715 5142	501.8	18.12	1.69	19 7.0
5	1 58 57.47	1.393	10 50 0.2	7.07	0.714 3053	505.6	18.17	1.70	19 3.3
6	1 59 30.67	+1.373	+10 52 48.3	+6.94	0.713 0873	−509.4	18.22	1.70	19 0.3
7	2 0 3.37	1.352	10 55 33.3	6.81	0.711 8604	513.0	18.27	1.71	18 56.9
8	2 0 35.58	1.331	10 58 15.2	6.68	0.710 6247	516.6	18.33	1.71	18 53.5
9	2 1 7.27	1.310	11 0 54.0	6.55	0.709 3806	520.1	18.38	1.72	18 50.1
10	2 1 38.45	1.289	11 3 29.6	6.42	0.708 1282	523.6	18.43	1.72	18 46.7
11	2 2 9.12	+1.267	+11 6 2.0	+6.29	0.706 8675	−526.9	18.48	1.73	18 43.2
12	2 2 39.26	1.245	11 8 31.3	6.15	0.705 5989	530.2	18.54	1.73	18 39.8
13	2 3 8.86	1.223	11 10 57.4	6.02	0.704 3225	533.4	18.59	1.74	18 36.3
14	2 3 37.94	1.200	11 13 20.3	5.89	0.703 0385	536.6	18.65	1.74	18 32.9
15	2 4 6.47	1.177	11 15 39.9	5.75	0.701 7470	539.7	18.70	1.75	18 29.4
16	2 4 34.44	+1.154	+11 17 56.2	+5.61	0.700 4482	−542.6	18.76	1.75	18 25.9
17	2 5 1.86	1.131	11 20 9.2	5.47	0.699 1424	545.5	18.82	1.76	18 22.5
18	2 5 28.72	1.107	11 22 18.9	5.33	0.697 8297	548.4	18.87	1.76	18 19.0
19	2 5 55.00	1.083	11 24 25.3	5.20	0.696 5102	551.1	18.93	1.77	18 15.5
20	2 6 20.70	1.059	11 26 28.3	5.05	0.695 1843	553.8	18.99	1.78	18 11.9
21	2 6 45.81	+1.034	+11 28 27.9	+4.91	0.693 8521	−556.4	19.05	1.78	18 8.4
22	2 7 10.33	1.009	11 30 24.1	4.77	0.692 5139	558.8	19.11	1.79	18 4.9
23	2 7 34.24	0.984	11 32 16.8	4.62	0.691 1698	561.2	19.16	1.79	18 1.3
24	2 7 57.55	0.958	11 34 6.0	4.48	0.689 8203	563.4	19.22	1.80	17 57.8
25	2 8 20.23	0.932	11 35 51.7	4.33	0.688 4655	565.5	19.28	1.80	17 54.2
26	2 8 42.28	+0.906	+11 37 33.8	+4.18	0.687 1058	−567.5	19.34	1.81	17 50.6
27	2 9 3.70	0.879	11 39 12.4	4.04	0.685 7414	569.4	19.41	1.82	17 47.0
28	2 9 24.47	0.852	11 40 47.5	3.89	0.684 3727	571.2	19.47	1.82	17 43.5
29	2 9 44.60	0.825	11 42 18.9	3.73	0.682 9999	572.8	19.53	1.83	17 39.9
30	2 10 4.07	0.798	11 43 46.7	3.58	0.681 6234	574.3	19.59	1.83	17 36.2
31	2 10 22.88	+0.770	+11 45 10.8	+3.43	0.680 2435	−575.6	19.65	1.84	17 32.6
Aug. 1	2 10 41.02	0.742	11 46 31.3	3.28	0.678 8607	576.8	19.72	1.84	17 29.0
2	2 10 58.48	0.713	11 47 48.2	3.13	0.677 4752	577.8	19.78	1.85	17 25.3
3	2 11 15.26	0.685	11 49 1.3	2.97	0.676 0875	578.6	19.84	1.86	17 21.7
4	2 11 31.34	0.656	11 50 10.7	2.81	0.674 6978	579.3	19.91	1.86	17 18.0
5	2 11 46.74	+0.627	+11 51 16.4	+2.66	0.673 3066	−579.9	19.97	1.87	17 14.3
6	2 12 1.44	0.598	11 52 18.3	2.50	0.671 9142	580.3	20.03	1.87	17 10.6
7	2 12 15.45	0.569	11 53 16.5	2.35	0.670 5209	580.6	20.10	1.88	17 6.9
8	2 12 28.75	0.540	11 54 11.0	2.19	0.669 1272	580.8	20.16	1.89	17 3.2
9	2 12 41.35	0.510	11 55 1.8	2.04	0.667 7334	580.7	20.23	1.89	16 59.4
10	2 12 53.22	+0.480	+11 55 48.7	+1.88	0.666 3398	−580.5	20.29	1.90	16 55.7
11	2 13 4.38	0.450	11 56 31.9	1.72	0.664 9469	580.2	20.36	1.90	16 51.9
12	2 13 14.81	0.419	11 57 11.2	1.56	0.663 5549	579.7	20.42	1.91	16 48.2
13	2 13 24.51	0.389	11 57 46.8	1.40	0.662 1644	579.1	20.49	1.92	16 44.4
14	2 13 33.47	0.358	11 58 18.5	1.24	0.660 7755	578.3	20.55	1.92	16 40.6
15	2 13 41.70	+0.327	+11 58 46.4	+1.08	0.659 3887	−577.3	20.62	1.93	16 36.8
16	*2 13 49.18*	+0.296	+11 59 10.4	+0.92	0.658 0045	−576.1	20.69	1.93	16 33.0

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″			″	″	h m
Aug. 16	2 13 49.18	+0.296	+11 59 10.4	+0.92	0.658 0045	−576.1	20.69	1.93	16 33.0
17	2 13 55.92	0.265	11 59 30.5	0.76	0.656 6233	574.8	20.75	1.94	16 29.1
18	2 14 1.90	0.234	11 59 46.8	0.60	0.655 2455	573.3	20.82	1.95	16 25.3
19	2 14 7.13	0.202	11 59 59.2	0.43	0.653 8715	571.6	20.88	1.95	16 21.5
20	2 14 11.60	0.170	12 0 7.6	0.27	0.652 5018	569.7	20.95	1.96	16 17.6
21	2 14 15.30	+0.138	+12 0 12.2	+0.11	0.651 1370	−567.6	21.02	1.97	16 13.7
22	2 14 18.24	0.106	12 0 12.8	−0.06	0.649 7774	565.3	21.08	1.97	16 9.8
23	2 14 20.40	0.074	12 0 9.4	0.22	0.648 4236	562.8	21.15	1.98	16 5.9
24	2 14 21.79	0.042	12 0 2.1	0.39	0.647 0762	560.0	21.21	1.98	16 2.0
25	2 14 22.41	+0.010	11 59 50.9	0.55	0.645 7356	557.1	21.28	1.99	15 58.1
26	2 14 22.25	−0.023	+11 59 35.7	−0.72	0.644 4024	−553.9	21.34	2.00	15 54.1
27	2 14 21.31	0.055	11 59 16.5	0.88	0.643 0772	550.4	21.41	2.00	15 50.2
28	2 14 19.59	0.088	11 58 53.5	1.04	0.641 7604	546.8	21.47	2.01	15 46.2
29	2 14 17.09	0.120	11 58 26.5	1.21	0.640 4527	542.9	21.54	2.01	15 42.2
30	2 14 13.81	0.153	11 57 55.6	1.37	0.639 1547	538.8	21.60	2.02	15 38.2
31	2 14 9.75	−0.185	+11 57 20.8	−1.53	0.637 8669	−534.4	21.67	2.03	15 34.2
Sept. 1	2 14 4.92	0.218	11 56 42.1	1.69	0.636 5899	529.8	21.73	2.03	15 30.2
2	2 13 59.31	0.250	11 55 59.6	1.85	0.635 3243	524.9	21.80	2.04	15 26.2
3	2 13 52.94	0.281	11 55 13.2	2.01	0.634 0706	519.8	21.86	2.04	15 22.1
4	2 13 45.80	0.313	11 54 23.0	2.17	0.632 8293	514.5	21.92	2.05	15 18.1
5	2 13 37.90	−0.345	+11 53 29.0	−2.33	0.631 6010	−509.0	21.98	2.06	15 14.0
6	2 13 29.24	0.376	11 52 31.2	2.49	0.630 3863	503.2	22.04	2.06	15 9.9
7	2 13 19.83	0.408	11 51 29.6	2.64	0.629 1857	497.2	22.10	2.07	15 5.8
8	2 13 9.67	0.439	11 50 24.3	2.80	0.627 9999	490.9	22.17	2.07	15 1.7
9	2 12 58.76	0.470	11 49 15.3	2.95	0.626 8294	484.5	22.23	2.08	14 57.6
10	2 12 47.11	−0.500	+11 48 2.6	−3.11	0.625 6747	−477.8	22.28	2.08	14 53.5
11	2 12 34.74	0.531	11 46 46.2	3.26	0.624 5363	470.9	22.34	2.09	14 49.3
12	2 12 21.64	0.561	11 45 26.2	3.41	0.623 4147	463.8	22.40	2.09	14 45.2
13	2 12 7.81	0.591	11 44 2.7	3.55	0.622 3105	456.4	22.46	2.10	14 41.0
14	2 11 53.27	0.620	11 42 35.6	3.70	0.621 2243	448.8	22.52	2.11	14 36.8
15	2 11 38.03	−0.650	+11 41 5.0	−3.85	0.620 1567	−440.9	22.57	2.11	14 32.6
16	2 11 22.08	0.679	11 39 30.9	3.99	0.619 1083	432.8	22.62	2.12	14 28.4
17	2 11 5.44	0.708	11 37 53.3	4.14	0.618 0796	424.4	22.68	2.12	14 24.2
18	2 10 48.12	0.736	11 36 12.3	4.28	0.617 0713	415.8	22.73	2.13	14 20.0
19	2 10 30.12	0.764	11 34 28.0	4.41	0.616 0839	407.0	22.78	2.13	14 15.7
20	2 10 11.45	−0.791	+11 32 40.4	−4.55	0.615 1181	−397.9	22.83	2.14	14 11.5
21	2 9 52.13	0.818	11 30 49.5	4.69	0.614 1744	388.5	22.88	2.14	14 7.2
22	2 9 32.17	0.845	11 28 55.4	4.82	0.613 2534	378.9	22.93	2.14	14 3.0
23	2 9 11.58	0.871	11 26 58.2	4.95	0.612 3558	369.0	22.98	2.15	13 58.7
24	2 8 50.37	0.896	11 24 57.9	5.07	0.611 4822	359.0	23.02	2.15	13 54.5
25	2 8 28.55	−0.921	+11 22 54.7	−5.19	0.610 6330	−348.6	23.07	2.16	13 50.1
26	2 8 6.15	0.945	11 20 48.6	5.31	0.609 8090	338.0	23.11	2.16	13 45.8
27	2 7 43.17	0.969	11 18 39.6	5.43	0.609 0107	327.2	23.16	2.17	13 41.5
28	2 7 19.63	0.992	11 16 27.9	5.54	0.608 2385	316.2	23.20	2.17	13 37.2
29	2 6 55.55	1.015	11 14 13.5	5.65	0.607 4930	305.0	23.24	2.17	13 32.8
30	2 6 30.94	−1.036	+11 11 56.5	−5.76	0.606 7748	−293.5	23.28	2.18	13 28.5
Oct. 1	2 6 5.84	−1.056	+11 9 37.0	−5.86	0.606 0843	−281.9	23.31	2.18	13 24.1

JUPITER, 1916.

GREENWICH MEAN TIME.

Date.		Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
		Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	
		h m s	s	° ′ ″	″			″	″	h m
Oct.	1	2 6 5.84	−1.056	+11 9 37.0	−5.86	0.606 0843	−281.9	23.31	2.18	13 24.1
	2	2 5 40.25	1.076	11 7 15.2	5.96	0.605 4220	270.0	23.35	2.18	13 19.8
	3	2 5 14.19	1.095	11 4 51.1	6.05	0.604 7883	258.0	23.38	2.19	13 15.4
	4	2 4 47.68	1.114	11 2 24.9	6.14	0.604 1836	245.9	23.42	2.19	13 11.0
	5	2 4 20.74	1.131	10 59 56.5	6.23	0.603 6084	233.5	23.45	2.19	13 6.6
	6	2 3 53.39	−1.148	+10 57 26.1	−6.31	0.603 0629	−221.1	23.48	2.20	13 2.2
	7	2 3 25.66	1.163	10 54 53.8	6.38	0.602 5475	208.4	23.50	2.20	12 57.8
	8	2 2 57.56	1.178	10 52 19.8	6.45	0.602 0626	195.6	23.53	2.20	12 53.4
	9	2 2 29.11	1.193	10 49 44.1	6.52	0.601 6086	182.7	23.55	2.20	12 49.0
	10	2 2 0.33	1.206	10 47 6.8	6.58	0.601 1858	169.7	23.58	2.21	12 44.6
	11	2 1 31.24	−1.218	+10 44 28.1	−6.64	0.600 7944	−156.5	23.60	2.21	12 40.2
	12	2 1 1.86	1.230	10 41 48.0	6.70	0.600 4347	143.2	23.62	2.21	12 35.8
	13	2 0 32.22	1.240	10 39 6.6	6.75	0.600 1069	129.9	23.64	2.21	12 31.4
	14	2 0 2.33	1.250	10 36 24.1	6.79	0.599 8113	116.4	23.65	2.21	12 26.9
	15	1 59 32.21	1.259	10 33 40.5	6.83	0.599 5483	102.8	23.67	2.21	12 22.5
	16	1 59 1.89	−1.267	+10 30 56.1	−6.87	0.599 3180	− 89.1	23.68	2.21	12 18.1
	17	1 58 31.39	1.274	10 28 10.9	6.90	0.599 1207	75.3	23.69	2.22	12 13.6
	18	1 58 0.74	1.280	10 25 25.0	6.92	0.598 9567	61.4	23.70	2.22	12 9.2
	19	1 57 29.95	1.285	10 22 38.6	6.94	0.598 8261	47.4	23.71	2.22	12 4.7
	20	1 56 59.05	1.290	10 19 51.9	6.95	0.598 7291	33.4	23.71	2.22	12 0.3
	21	1 56 28.06	−1.293	+10 17 4.8	−6.96	0.598 6658	− 19.3	23.72	2.22	11 55.9
	22	1 55 57.01	1.295	10 14 17.6	6.97	0.598 6363	− 5.3	23.72	2.22	11 51.4
	23	1 55 25.92	1.296	10 11 30.4	6.96	0.598 6406	+ 8.8	23.72	2.22	11 47.0
	24	1 54 54.83	1.296	10 8 43.4	6.95	0.598 6789	23.0	23.71	2.22	11 42.5
	25	1 54 23.74	1.295	10 5 56.6	6.94	0.598 7512	37.2	23.71	2.22	11 38.1
	26	1 53 52.69	−1.293	+10 3 10.3	−6.92	0.598 8575	+ 51.4	23.70	2.22	11 33.6
	27	1 53 21.71	1.289	10 0 24.5	6.89	0.598 9979	65.5	23.70	2.22	11 29.2
	28	1 52 50.81	1.285	9 57 39.4	6.86	0.599 1721	79.6	23.69	2.22	11 24.8
	29	1 52 20.02	1.280	9 54 55.2	6.82	0.599 3802	93.7	23.68	2.21	11 20.3
	30	1 51 49.38	1.274	9 52 11.9	6.78	0.599 6220	107.7	23.66	2.21	11 15.9
	31	1 51 18.89	−1.266	+ 9 49 29.8	−6.73	0.599 8973	+121.6	23.65	2.21	11 11.4
Nov.	1	1 50 48.60	1.258	9 46 48.9	6.68	0.600 2059	135.5	23.63	2.21	11 7.0
	2	1 50 18.51	1.249	9 44 9.4	6.61	0.600 5475	149.2	23.61	2.21	11 2.5
	3	1 49 48.66	1.239	9 41 31.5	6.55	0.600 9220	162.8	23.59	2.21	10 58.1
	4	1 49 19.06	1.228	9 38 55.2	6.48	0.601 3290	176.3	23.57	2.20	10 53.7
	5	1 48 49.74	−1.216	+ 9 36 20.6	−6.40	0.601 7683	+189.7	23.55	2.20	10 49.3
	6	1 48 20.72	1.203	9 33 47.9	6.32	0.602 2396	203.0	23.52	2.20	10 44.9
	7	1 47 52.03	1.189	9 31 17.2	6.24	0.602 7425	216.1	23.49	2.20	10 40.5
	8	1 47 23.67	1.174	9 28 48.5	6.15	0.603 2768	229.1	23.46	2.19	10 36.1
	9	1 46 55.68	1.159	9 26 22.1	6.05	0.603 8420	241.9	23.43	2.19	10 31.7
	10	1 46 28.06	−1.143	+ 9 23 58.1	−5.95	0.604 4378	+254.6	23.40	2.19	10 27.3
	11	1 46 0.84	1.126	9 21 36.5	5.85	0.605 0639	267.1	23.37	2.19	10 22.9
	12	1 45 34.04	1.108	9 19 17.5	5.74	0.605 7198	279.5	23.33	2.18	10 18.6
	13	1 45 7.68	1.089	9 17 1.1	5.63	0.606 4052	291.7	23.30	2.18	10 14.2
	14	1 44 41.77	1.070	9 14 47.5	5.51	0.607 1197	303.7	23.26	2.18	10 9.8
	15	1 44 16.34	−1.050	+ 9 12 36.8	−5.39	0.607 8630	+315.6	23.22	2.17	10 5.5
	16	*1 43 51.39*	*−1.029*	+ 9 10 29.0	−5.26	0.608 6346	+327.3	23.18	2.17	10 1.1

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h m
16	1 43 51.39	−1.029	+9 10 29.0	−5.26	0.608 6346	+327.3	23.18	2.17	10 1.1
17	1 43 26.96	1.007	9 8 24.3	5.13	0.609 4340	338.8	23.13	2.16	9 56.8
18	1 43 3.05	0.985	9 6 22.8	4.99	0.610 2608	350.1	23.09	2.16	9 52.5
19	1 42 39.69	0.962	9 4 24.6	4.86	0.611 1145	361.3	23.04	2.15	9 48.2
20	1 42 16.88	0.938	9 2 29.7	4.71	0.611 9947	372.2	23.00	2.15	9 43.9
21	1 41 54.66	−0.914	+9 0 38.4	−4.56	0.612 9008	+382.9	22.95	2.15	9 39.6
22	1 41 33.02	0.889	8 58 50.6	4.41	0.613 8323	393.3	22.90	2.14	9 35.3
23	1 41 11.99	0.864	8 57 6.5	4.26	0.614 7886	403.6	22.85	2.14	9 31.0
24	1 40 51.58	0.838	8 55 26.1	4.10	0.615 7693	413.6	22.80	2.13	9 26.7
25	1 40 31.80	0.811	8 53 49.5	3.94	0.616 7737	423.3	22.75	2.13	9 22.5
26	1 40 12.68	−0.783	+8 52 16.8	−3.78	0.617 8012	+432.8	22.69	2.12	9 18.2
27	1 39 54.22	0.755	8 50 48.1	3.61	0.618 8512	442.1	22.64	2.12	9 14.0
28	1 39 36.44	0.726	8 49 23.4	3.44	0.619 9230	451.1	22.58	2.11	9 9.8
29	1 39 19.85	0.698	8 48 2.9	3.27	0.621 0160	459.8	22.52	2.11	9 5.6
30	1 39 2.96	0.668	8 46 46.5	3.10	0.622 1296	468.2	22.47	2.10	9 1.4
1	1 38 47.27	−0.639	+8 45 34.3	−2.92	0.623 2631	+476.4	22.41	2.10	8 57.2
2	1 38 32.30	0.609	8 44 26.4	2.74	0.624 4160	484.3	22.35	2.09	8 53.0
3	1 38 18.04	0.579	8 43 22.8	2.56	0.625 5875	491.9	22.29	2.08	8 48.9
4	1 38 4.52	0.548	8 42 23.5	2.38	0.626 7771	499.3	22.23	2.08	8 44.7
5	1 37 51.74	0.517	8 41 28.5	2.20	0.627 9840	506.4	22.17	2.07	8 40.6
6	1 37 39.70	−0.486	+8 40 38.0	−2.01	0.629 2076	+513.3	22.10	2.07	8 36.4
7	1 37 28.40	0.455	8 39 51.9	1.83	0.630 4475	519.9	22.04	2.06	8 32.3
8	1 37 17.86	0.424	8 39 10.2	1.64	0.631 7030	526.3	21.98	2.06	8 28.2
9	1 37 8.07	0.392	8 38 33.0	1.46	0.632 9733	532.3	21.91	2.05	8 24.1
10	1 36 59.05	0.360	8 38 0.3	1.27	0.634 2580	538.2	21.85	2.04	8 20.0
11	1 36 50.79	−0.328	+8 37 32.1	−1.08	0.635 5565	+543.8	21.78	2.04	8 16.0
12	1 36 43.30	0.296	8 37 8.4	0.89	0.636 8682	549.2	21.72	2.03	8 11.9
13	1 36 36.58	0.264	8 36 49.3	0.70	0.638 1925	554.4	21.65	2.02	8 7.9
14	1 36 30.64	0.231	8 36 34.7	0.51	0.639 5289	559.3	21.59	2.02	8 3.9
15	1 36 25.48	0.199	8 36 24.8	0.32	0.640 8767	563.9	21.52	2.01	7 59.8
16	1 36 21.11	−0.166	+8 36 19.4	−0.13	0.642 2355	+568.4	21.45	2.01	7 55.9
17	1 36 17.51	0.134	8 36 18.6	+0.06	0.643 6048	572.6	21.38	2.00	7 51.9
18	1 36 14.70	0.101	8 36 22.4	0.26	0.644 9838	576.6	21.32	1.99	7 47.9
19	1 36 12.68	0.068	8 36 30.9	0.45	0.646 3721	580.3	21.25	1.99	7 43.9
20	1 36 11.44	0.035	8 36 43.9	0.64	0.647 7691	583.8	21.18	1.98	7 40.0
21	1 36 10.99	−0.002	+8 37 1.5	+0.83	0.649 1741	+587.0	21.11	1.97	7 36.0
22	1 36 11.33	+0.031	8 37 23.7	1.02	0.650 5867	590.1	21.04	1.97	7 32.1
23	1 36 12.47	0.064	8 37 50.5	1.21	0.652 0062	592.8	20.97	1.96	7 28.2
24	1 36 14.39	0.097	8 38 21.9	1.40	0.653 4321	595.4	20.90	1.95	7 24.3
25	1 36 17.11	0.130	8 38 57.9	1.59	0.654 8639	597.7	20.84	1.95	7 20.4
26	1 36 20.61	+0.162	+8 39 38.4	+1.78	0.656 3009	+599.8	20.77	1.94	7 16.6
27	1 36 24.90	0.195	8 40 23.5	1.97	0.657 7426	601.6	20.70	1.94	7 12.7
28	1 36 29.97	0.228	8 41 13.1	2.16	0.659 1885	603.2	20.63	1.93	7 8.9
29	1 36 35.83	0.260	8 42 7.2	2.35	0.660 6379	604.6	20.56	1.92	7 5.0
30	1 36 42.46	0.292	8 43 5.7	2.53	0.662 0903	605.7	20.49	1.92	7 1.2
31	1 36 49.86	+0.324	+8 44 8.7	+2.71	0.663 5452	+606.7	20.42	1.91	6 57.4
32	1 36 58.03	. . .	+8 45 15.9	. . .	0.665 0022	. . .	20.36	1.90	6 53.8

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		° ′ ″	′ ″	″	° ′ ″	″		
Jan.	3	3 22 1.6	5 29.51	+5.8	−1 18 3.9	−0.82	0.695 1165	−53.3
	7	3 43 59.7	5 29.54	5.5	1 18 7.1	0.77	0.695 0956	51.3
	11	4 5 57.9	5 29.57	5.1	1 18 10.1	0.72	0.695 0755	49.3
	15	4 27 56.3	5 29.61	4.8	1 18 12.8	0.67	0.695 0562	47.3
	19	4 49 54.8	5 29.64	4.5	1 18 15.4	0.62	0.695 0377	45.3
	23	5 11 53.4	5 29.66	+4.1	−1 18 17.8	−0.57	0.695 0199	−43.3
	27	5 33 52.1	5 29.68	3.8	1 18 20.0	0.52	0.695 0030	41.3
	31	5 55 50.9	5 29.70	3.4	1 18 22.0	0.48	0.694 9869	39.3
Feb.	4	6 17 49.7	5 29.73	3.1	1 18 23.8	0.43	0.694 9716	37.3
	8	6 39 48.7	5 29.75	2.8	1 18 25.4	0.38	0.694 9570	35.3
	12	7 1 47.8	5 29.77	+2.4	−1 18 26.9	−0.33	0.694 9433	−33.3
	16	7 23 46.9	5 29.79	2.1	1 18 28.1	0.28	0.694 9304	31.3
	20	7 45 46.1	5 29.81	1.7	1 18 29.1	0.24	0.694 9183	29.3
	24	8 7 45.4	5 29.83	1.4	1 18 30.0	0.19	0.694 9070	27.2
	28	8 29 44.7	5 29.85	1.0	1 18 30.7	0.14	0.694 8965	25.1
Mar.	3	8 51 44.2	5 29.86	+0.7	−1 18 31.1	−0.09	0.694 8869	−23.1
	7	9 13 43.6	5 29.87	+0.4	1 18 31.4	−0.05	0.694 8781	21.1
	11	9 35 43.1	5 29.88	0.0	1 18 31.5	0.00	0.694 8700	19.1
	15	9 57 42.7	5 29.89	−0.3	1 18 31.4	+0.05	0.694 8628	17.0
	19	10 19 42.3	5 29.90	0.7	1 18 31.1	0.10	0.694 8564	15.0
	23	10 41 41.9	5 29.90	−1.0	−1 18 30.6	+0.15	0.694 8508	−13.0
	27	11 3 41.5	5 29.91	1.4	1 18 29.9	0.20	0.694 8460	10.9
	31	11 25 41.2	5 29.92	1.7	1 18 29.0	0.25	0.694 8421	8.9
Apr.	4	11 47 40.9	5 29.93	2.1	1 18 27.9	0.30	0.694 8389	6.9
	8	12 9 40.6	5 29.93	2.4	1 18 26.6	0.34	0.694 8366	4.9
	12	12 31 40.3	5 29.93	−2.7	−1 18 25.2	+0.39	0.694 8350	− 2.8
	16	12 53 40.1	5 29.93	3.1	1 18 23.5	0.43	0.694 8343	− 0.8
	20	13 15 39.8	5 29.93	3.4	1 18 21.7	0.48	0.694 8344	+ 1.3
	24	13 37 39.5	5 29.93	3.8	1 18 19.7	0.53	0.694 8353	3.3
	28	13 59 39.2	5 29.93	4.1	1 18 17.4	0.58	0.694 8370	5.3
May	2	14 21 38.9	5 29.93	−4.4	−1 18 15.0	+0.63	0.694 8396	+ 7.3
	6	14 43 38.6	5 29.92	4.8	1 18 12.4	0.68	0.694 8429	9.3
	10	15 5 38.3	5 29.91	5.1	1 18 9.6	0.73	0.694 8470	11.4
	14	15 27 37.9	5 29.90	5.5	1 18 6.6	0.78	0.694 8520	13.5
	18	15 49 37.5	5 29.90	5.8	1 18 3.4	0.82	0.694 8578	15.5
	22	16 11 37.1	5 29.89	−6.1	−1 18 0.0	+0.87	0.694 8644	+17.6
	26	16 33 36.6	5 29.88	6.5	1 17 56.5	0.91	0.694 8719	19.6
	30	16 55 36.1	5 29.86	6.8	1 17 52.7	0.96	0.694 8801	21.7
June	3	17 17 35.5	5 29.84	7.1	1 17 48.8	1.01	0.694 8892	23.7
	7	17 39 34.8	5 29.83	7.5	1 17 44.6	1.06	0.694 8991	25.7
	11	18 1 34.1	5 29.82	−7.8	−1 17 40.3	+1.11	0.694 9098	+27.7
	15	18 23 33.4	5 29.80	8.1	1 17 35.7	1.16	0.694 9213	29.7
	19	18 45 32.5	5 29.78	8.4	1 17 31.0	1.20	0.694 9335	31.7
	23	19 7 31.6	5 29.76	8.8	1 17 26.1	1.25	0.694 9466	33.7
	27	19 29 30.6	5 29.74	9.1	1 17 21.0	1.30	0.694 9605	35.8
July	1	19 51 29.5	5 29.72	−9.4	−1 17 15.7	+1.34	0.694 9752	+37.8
	5	20 13 28.4	5 29.70	−9.7	−1 17 10.3	+1.39	0.694 9907	+39.8

FOR GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
	° ′ ″	′ ″	″	° ′ ″	″		
July 1	19 51 29.5	5 29.72	− 9.4	−1 17 15.7	+1.34	0.694 9752	+ 37.8
5	20 13 28.4	5 29.70	9.7	1 17 10.3	1.39	0.694 9907	39.8
9	20 35 27.1	5 29.67	10.0	1 17 4.6	1.44	0.695 0070	41.8
13	20 57 25.7	5 29.64	10.4	1 16 58.8	1.49	0.695 0242	43.8
17	21 19 24.2	5 29.62	10.7	1 16 52.7	1.53	0.695 0421	45.8
21	21 41 22.7	5 29.59	−11.0	−1 16 46.5	+1.58	0.695 0608	+ 47.8
25	22 3 21.0	5 29.56	11.3	1 16 40.1	1.62	0.695 0803	49.7
29	22 25 19.1	5 29.53	11.6	1 16 33.5	1.67	0.695 1006	51.7
Aug. 2	22 47 17.2	5 29.50	11.9	1 16 26.7	1.72	0.695 1216	53.7
6	23 9 15.1	5 29.46	12.2	1 16 19.7	1.76	0.695 1435	55.7
10	23 31 12.9	5 29.42	−12.5	−1 16 12.6	+1.81	0.695 1662	+ 57.7
14	23 53 10.5	5 29.39	12.8	1 16 5.3	1.86	0.695 1897	59.7
18	24 15 8.0	5 29.36	13.1	1 15 57.7	1.91	0.695 2140	61.7
22	24 37 5.4	5 29.32	13.4	1 15 50.0	1.95	0.695 2391	63.7
26	24 59 2.5	5 29.28	13.7	1 15 42.1	1.99	0.695 2650	65.7
30	25 20 59.6	5 29.23	−14.0	−1 15 34.1	+2.04	0.695 2916	+ 67.6
Sept. 3	25 42 56.4	5 29.19	14.3	1 15 25.8	2.09	0.695 3191	69.6
7	26 4 53.1	5 29.15	14.6	1 15 17.3	2.14	0.695 3473	71.5
11	26 26 49.6	5 29.10	14.9	1 15 8.7	2.18	0.695 3763	73.5
15	26 48 45.9	5 29.06	15.2	1 14 59.9	2.22	0.695 4061	75.5
19	27 10 42.1	5 29.01	−15.5	−1 14 50.9	+2.27	0.695 4367	+ 77.5
23	27 32 38.0	5 28.96	15.8	1 14 41.7	2.32	0.695 4681	79.4
27	27 54 33.8	5 28.91	16.0	1 14 32.3	2.37	0.695 5002	81.4
Oct. 1	28 16 29.3	5 28.86	16.3	1 14 22.7	2.41	0.695 5332	83.3
5	28 38 24.7	5 28.81	16.6	1 14 13.0	2.45	0.695 5669	85.2
9	29 0 19.8	5 28.75	−16.8	−1 14 3.1	+2.50	0.695 6013	+ 87.1
13	29 22 14.7	5 28.70	17.1	1 13 53.0	2.54	0.695 6366	89.1
17	29 44 9.4	5 28.65	17.4	1 13 42.8	2.58	0.695 6726	90.9
21	30 6 3.9	5 28.60	17.6	1 13 32.4	2.62	0.695 7093	92.9
25	30 27 58.2	5 28.54	17.9	1 13 21.8	2.67	0.695 7469	94.8
29	30 49 52.2	5 28.48	−18.1	−1 13 11.0	+2.72	0.695 7852	+ 96.7
Nov. 2	31 11 46.0	5 28.41	18.4	1 13 0.0	2.77	0.695 8243	98.6
6	31 33 39.5	5 28.35	18.6	1 12 48.9	2.81	0.695 8641	100.5
10	31 55 32.8	5 28.30	18.9	1 12 37.5	2.86	0.695 9047	102.5
14	32 17 25.9	5 28.23	19.1	1 12 26.0	2.89	0.695 9461	104.4
18	32 39 18.7	5 28.16	−19.4	−1 12 14.4	+2.94	0.695 9882	+106.2
22	33 1 11.2	5 28.09	19.6	1 12 2.5	2.99	0.696 0311	108.1
26	33 23 3.4	5 28.02	19.8	1 11 50.5	3.02	0.696 0747	110.0
30	33 44 55.4	5 27.96	20.0	1 11 38.4	3.06	0.696 1191	111.9
Dec. 4	34 6 47.1	5 27.90	20.3	1 11 26.0	3.11	0.696 1642	113.8
8	34 28 38.6	5 27.82	−20.5	−1 11 13.5	+3.15	0.696 2101	+115.6
12	34 50 29.7	5 27.75	20.7	1 11 0.8	3.20	0.696 2567	117.4
16	35 12 20.6	5 27.68	20.9	1 10 47.9	3.24	0.696 3040	119.2
20	35 34 11.2	5 27.60	21.2	1 10 34.9	3.28	0.696 3521	121.1
24	35 56 1.4	5 27.52	21.4	1 10 21.7	3.32	0.696 4009	123.0
28	36 17 51.4	5 27.45	−21.6	−1 10 8.3	+3.36	0.696 4505	+124.8
32	36 39 41.0	5 27.38	−21.8	−1 9 54.8	+3.40	0.696 5008	+126.6

SATURN, 1916.

GREENWICH MEAN TIME.

Date.		Apparent Right Ascension. Noon.	Var. per Hour. Noon.	Apparent Declination. Noon.	Var. per Hour. Noon.	Logarithm of Distance from Earth. Noon.	Var. per Hour. Noon.	Polar Semi-diameter. Noon.	Hor. Paral-lax. Noon.	Transit, Meridian of Green-wich.
		h m s	s	° ′ ″	″			″	″	h m
Jan.	1	6 57 33.82	−0.886	+22 18 3.2	+1.48	0.905 3597	− 21.9	9.63	1.10	12 16.1
	2	6 57 12.54	0.887	22 18 38.8	1.48	0.905 3158	14.6	9.63	1.10	12 11.8
	3	6 56 51.24	0.888	22 19 14.3	1.48	0.905 2893	7.4	9.63	1.10	12 7.5
	4	6 56 29.92	0.889	22 19 49.7	1.47	0.905 2802	− 0.2	9.63	1.10	12 3.2
	5	6 56 8.59	0.889	22 20 25.0	1.47	0.905 2884	+ 7.0	9.63	1.10	11 59.0
	6	6 55 47.27	−0.888	+22 21 0.2	+1.46	0.905 3140	+ 14.3	9.63	1.09	11 54.7
	7	6 55 25.97	0.887	22 21 35.3	1.46	0.905 3569	21.5	9.63	1.09	11 50.4
	8	6 55 4.71	0.885	22 22 10.2	1.45	0.905 4171	28.7	9.63	1.09	11 46.1
	9	6 54 43.49	0.883	22 22 44.9	1.44	0.905 4945	35.8	9.63	1.09	11 41.8
	10	6 54 22.33	0.880	22 23 19.4	1.43	0.905 5890	42.9	9.63	1.09	11 37.5
	11	6 54 1.24	−0.877	+22 23 53.7	+1.42	0.905 7006	+ 50.1	9.63	1.09	11 33.3
	12	6 53 40.24	0.873	22 24 27.8	1.41	0.905 8293	57.1	9.63	1.09	11 29.0
	13	6 53 19.33	0.869	22 25 1.6	1.41	0.905 9749	64.2	9.62	1.09	11 24.7
	14	6 52 58.53	0.864	22 25 35.3	1.40	0.906 1373	71.2	9.62	1.09	11 20.4
	15	6 52 37.86	0.859	22 26 8.6	1.38	0.906 3165	78.1	9.61	1.09	11 16.2
	16	6 52 17.32	−0.853	+22 26 41.7	+1.37	0.906 5124	+ 85.0	9.61	1.09	11 11.9
	17	6 51 56.92	0.847	22 27 14.4	1.36	0.906 7247	91.9	9.60	1.09	11 7.6
	18	6 51 36.68	0.840	22 27 46.8	1.34	0.906 9535	98.7	9.60	1.09	11 3.3
	19	6 51 16.60	0.833	22 28 18.9	1.33	0.907 1986	105.5	9.59	1.09	10 59.1
	20	6 50 56.70	0.825	22 28 50.7	1.32	0.907 4598	112.2	9.59	1.09	10 54.8
	21	6 50 36.99	−0.817	+22 29 22.2	+1.30	0.907 7370	+118.8	9.58	1.09	10 50.6
	22	6 50 17.47	0.809	22 29 53.3	1.29	0.908 0300	125.4	9.57	1.09	10 46.3
	23	6 49 58.17	0.800	22 30 24.1	1.28	0.908 3388	131.9	9.56	1.09	10 42.1
	24	6 49 39.08	0.790	22 30 54.5	1.26	0.908 6631	138.4	9.56	1.09	10 37.8
	25	6 49 20.23	0.781	22 31 24.5	1.24	0.909 0029	144.7	9.55	1.09	10 33.6
	26	6 49 1.61	−0.770	+22 31 54.2	+1.23	0.909 3579	+151.1	9.54	1.08	10 29.3
	27	6 48 43.25	0.760	22 32 23.5	1.21	0.909 7281	157.4	9.53	1.08	10 25.1
	28	6 48 25.15	0.748	22 32 52.4	1.20	0.910 1133	163.6	9.52	1.08	10 20.9
	29	6 48 7.33	0.737	22 33 20.9	1.18	0.910 5134	169.7	9.52	1.08	10 16.7
	30	6 47 49.79	0.725	22 33 49.0	1.16	0.910 9280	175.7	9.51	1.08	10 12.4
	31	6 47 32.53	−0.713	+22 34 16.7	+1.14	0.911 3570	+181.7	9.50	1.08	10 8.2
Feb.	1	6 47 15.58	0.700	22 34 43.9	1.13	0.911 8002	187.6	9.49	1.08	10 4.0
	2	6 46 58.95	0.686	22 35 10.8	1.11	0.912 2573	193.3	9.48	1.08	9 59.8
	3	6 46 42.63	0.673	22 35 37.1	1.09	0.912 7281	199.0	9.47	1.08	9 55.6
	4	6 46 26.65	0.659	22 36 3.1	1.07	0.913 2124	204.6	9.45	1.08	9 51.4
	5	6 46 11.01	−0.644	+22 36 28.6	+1.05	0.913 7100	+210.0	9.44	1.07	9 47.2
	6	6 45 55.72	0.630	22 36 53.6	1.03	0.914 2206	215.4	9.43	1.07	9 43.0
	7	6 45 40.79	0.615	22 37 18.2	1.01	0.914 7440	220.7	9.42	1.07	9 38.9
	8	6 45 26.22	0.599	22 37 42.3	0.99	0.915 2798	225.8	9.41	1.07	9 34.7
	9	6 45 12.03	0.583	22 38 5.9	0.97	0.915 8278	230.8	9.40	1.07	9 30.5
	10	6 44 58.22	−0.567	+22 38 29.1	+0.95	0.916 3878	+235.7	9.39	1.07	9 26.4
	11	6 44 44.80	0.551	22 38 51.7	0.93	0.916 9593	240.5	9.38	1.07	9 22.2
	12	6 44 31.78	0.534	22 39 13.9	0.91	0.917 5422	245.2	9.36	1.07	9 18.1
	13	6 44 19.15	0.518	22 39 35.6	0.90	0.918 1362	249.7	9.35	1.06	9 13.9
	14	6 44 6.93	0.500	22 39 56.9	0.88	0.918 7409	254.2	9.34	1.06	9 9.8
	15	6 43 55.13	−0.483	+22 40 17.7	+0.86	0.919 3563	+258.5	9.32	1.06	9 5.7
	16	*6* 43 43.74	−0.466	+22 40 38.0	+0.84	0.919 9819	+262.7	9.31	1.06	9 1.5

GREENWICH MEAN TIME.

Date.		Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
		Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
		h m s	s	° ′ ″	″			″	″	h m
Feb.	16	6 43 43.74	−0.466	+22 40 38.0	+0.84	0.919 9819	+262.7	9.31	1.06	9 1.5
	17	6 43 32.77	0.448	22 40 57.8	0.81	0.920 6175	266.9	9.30	1.06	8 57.4
	18	6 43 22.23	0.430	22 41 17.1	0.79	0.921 2629	270.9	9.29	1.05	8 53.3
	19	6 43 12.12	0.412	22 41 36.0	0.77	0.921 9176	274.7	9.27	1.05	8 49.2
	20	6 43 2.45	0.394	22 41 54.3	0.75	0.922 5815	278.5	9.26	1.05	8 45.2
	21	6 42 53.22	−0.375	+22 42 12.2	+0.74	0.923 2542	+282.1	9.25	1.05	8 41.1
	22	6 42 44.43	0.357	22 42 29.6	0.71	0.923 9356	285.6	9.23	1.05	8 37.0
	23	6 42 36.09	0.338	22 42 46.5	0.69	0.924 6253	289.1	9.22	1.04	8 32.9
	24	6 42 28.21	0.319	22 43 2.9	0.67	0.925 3231	292.4	9.20	1.04	8 28.9
	25	6 42 20.78	0.300	22 43 18.8	0.65	0.926 0287	295.6	9.19	1.04	8 24.8
	26	6 42 13.82	−0.280	+22 43 34.3	+0.63	0.926 7419	+298.7	9.17	1.04	8 20.8
	27	6 42 7.32	0.261	22 43 49.2	0.61	0.927 4624	301.7	9.16	1.04	8 16.7
	28	6 42 1.28	0.242	22 44 3.7	0.59	0.928 1899	304.5	9.14	1.03	8 12.7
	29	6 41 55.71	0.222	22 44 17.7	0.57	0.928 9241	307.3	9.13	1.03	8 8.7
Mar.	1	6 41 50.62	0.202	22 44 31.2	0.55	0.929 6648	309.9	9.11	1.03	8 4.7
	2	6 41 46.01	−0.182	+22 44 44.3	+0.53	0.930 4116	+312.4	9.09	1.03	8 0.7
	3	6 41 41.87	0.162	22 44 56.8	0.51	0.931 1642	314.8	9.08	1.03	7 56.7
	4	6 41 38.22	0.142	22 45 8.8	0.49	0.931 9224	317.0	9.06	1.03	7 52.7
	5	6 41 35.05	0.122	22 45 20.3	0.47	0.932 6858	319.1	9.05	1.03	7 48.7
	6	6 41 32.37	0.101	22 45 31.3	0.45	0.933 4541	321.1	9.03	1.03	7 44.7
	7	6 41 30.18	−0.081	+22 45 41.8	+0.43	0.934 2271	+323.0	9.01	1.02	7 40.7
	8	6 41 28.47	0.061	22 45 51.8	0.41	0.935 0045	324.7	9.00	1.02	7 36.8
	9	6 41 27.25	0.041	22 46 1.3	0.39	0.935 7858	326.4	8.98	1.02	7 32.8
	10	6 41 26.52	−0.020	22 46 10.3	0.36	0.936 5710	327.9	8.97	1.02	7 28.9
	11	6 41 26.27	0.000	22 46 18.8	0.34	0.937 3595	329.2	8.95	1.02	7 25.0
	12	6 41 26.51	+0.020	+22 46 26.8	+0.32	0.938 1512	+330.5	8.93	1.02	7 21.0
	13	6 41 27.24	0.041	22 46 34.3	0.30	0.938 9459	331.7	8.92	1.02	7 17.1
	14	6 41 28.46	0.061	22 46 41.3	0.28	0.939 7432	332.7	8.90	1.01	7 13.2
	15	6 41 30.16	0.081	22 46 47.8	0.26	0.940 5428	333.6	8.88	1.01	7 9.3
	16	6 41 32.35	0.101	22 46 53.8	0.24	0.941 3446	334.5	8.86	1.01	7 5.4
	17	6 41 35.01	+0.121	+22 46 59.3	+0.22	0.942 1483	+335.2	8.85	1.01	7 1.5
	18	6 41 38.16	0.141	22 47 4.2	0.20	0.942 9537	335.9	8.83	1.01	6 57.7
	19	6 41 41.78	0.161	22 47 8.7	0.18	0.943 7604	336.4	8.81	1.00	6 53.8
	20	6 41 45.88	0.181	22 47 12.7	0.16	0.944 5683	336.8	8.80	1.00	6 49.9
	21	6 41 50.46	0.201	22 47 16.2	0.13	0.945 3772	337.2	8.78	1.00	6 46.1
	22	6 41 55.52	+0.221	+22 47 19.1	+0.11	0.946 1868	+337.4	8.76	1.00	6 42.2
	23	6 42 1.05	0.240	22 47 21.6	0.09	0.946 9968	337.5	8.75	1.00	6 38.4
	24	6 42 7.05	0.260	22 47 23.6	0.07	0.947 8070	337.6	8.73	0.99	6 34.6
	25	6 42 13.53	0.280	22 47 25.0	0.05	0.948 6173	337.6	8.72	0.99	6 30.7
	26	6 42 20.47	0.299	22 47 25.9	0.03	0.949 4273	337.4	8.70	0.99	6 26.9
	27	6 42 27.88	+0.319	+22 47 26.3	+0.01	0.950 2369	+337.2	8.68	0.99	6 23.1
	28	6 42 35.76	0.338	22 47 26.2	−0.02	0.951 0459	336.9	8.67	0.99	6 19.3
	29	6 42 44.10	0.357	22 47 25.5	0.04	0.951 8540	336.5	8.65	0.98	6 15.5
	30	6 42 52.90	0.376	22 47 24.3	0.06	0.952 6611	336.0	8.34	0.98	6 11.8
	31	6 43 2.16	0.395	22 47 22.6	0.08	0.953 4667	335.3	8.62	0.98	6 8.0
Apr.	1	6 43 11.88	+0.414	+22 47 20.3	−0.11	0.954 2707	+334.6	8.60	0.98	6 4.2
	2	6 43 22.05	+0.433	+22 47 17.5	−0.13	0.955 0729	+333.8	8.59	0.98	6 0.4

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h m
Apr. 1	6 43 11.88	+0.414	+22 47 20.3	−0.11	0.954 2707	+334.6	8.60	0.98	6 4.2
2	6 43 22.05	0.433	22 47 17.5	0.13	0.955 0729	333.8	8.59	0.98	6 0.4
3	6 43 32.67	0.452	22 47 14.2	0.15	0.955 8730	332.9	8.57	0.97	5 56.7
4	6 43 43.74	0.471	22 47 10.3	0.17	0.956 6708	331.9	8.56	0.97	5 52.9
5	6 43 55.26	0.489	22 47 5.9	0.20	0.957 4662	330.9	8.54	0.97	5 49.2
6	6 44 7.22	+0.507	+22 47 0.9	−0.22	0.958 2589	+329.7	8.53	0.97	5 45.5
7	6 44 19.61	0.525	22 46 55.4	0.24	0.959 0488	328.5	8.51	0.97	5 41.7
8	6 44 32.43	0.543	22 46 49.3	0.27	0.959 8355	327.1	8.50	0.96	5 38.0
9	6 44 45.69	0.561	22 46 42.6	0.29	0.960 6189	325.7	8.48	0.96	5 34.3
10	6 44 59.37	0.579	22 46 35.4	0.31	0.961 3988	324.2	8.47	0.96	5 30.6
11	6 45 13.47	+0.596	+22 46 27.6	−0.34	0.962 1751	+322.6	8.45	0.96	5 26.9
12	6 45 27.98	0.613	22 46 19.3	0.36	0.962 9475	321.0	8.44	0.96	5 23.2
13	6 45 42.91	0.631	22 46 10.4	0.38	0.963 7159	319.3	8.42	0.96	5 19.5
14	6 45 58.25	0.647	22 46 0.9	0.41	0.964 4801	317.5	8.41	0.96	5 15.9
15	6 46 13.99	0.664	22 45 50.8	0.43	0.965 2400	315.7	8.39	0.96	5 12.2
16	6 46 30.12	+0.680	+22 45 40.2	−0.45	0.965 9954	+313.8	8.38	0.95	5 8.5
17	6 46 46.65	0.697	22 45 29.0	0.50	0.966 7462	311.8	8.36	0.95	5 4.9
18	6 47 3.58	0.713	22 45 17.2	0.53	0.967 4922	309.8	8.35	0.95	5 1.2
19	6 47 20.88	0.729	22 45 4.8	0.53	0.968 2334	307.8	8.33	0.95	4 57.6
20	6 47 38.57	0.745	22 44 51.9	0.55	0.968 9694	305.6	8.32	0.95	4 53.9
21	6 47 56.64	+0.761	+22 44 38.4	−0.58	0.969 7003	+303.4	8.31	0.95	4 50.3
22	6 48 15.09	0.776	22 44 24.3	0.60	0.970 4258	301.1	8.29	0.95	4 46.7
23	6 48 33.90	0.792	22 44 9.6	0.63	0.971 1458	298.8	8.28	0.94	4 43.1
24	6 48 53.08	0.807	22 43 54.3	0.65	0.971 8602	296.5	8.27	0.94	4 39.5
25	6 49 12.63	0.822	22 43 38.4	0.67	0.972 5689	294.1	8.26	0.94	4 35.9
26	6 49 32.53	+0.837	+22 43 21.9	−0.70	0.973 2718	+291.6	8.24	0.94	4 32.3
27	6 49 52.79	0.851	22 43 4.7	0.73	0.973 9685	289.0	8.23	0.94	4 28.7
28	6 50 13.39	0.866	22 42 47.0	0.75	0.974 3591	286.4	8.22	0.93	4 25.1
29	6 50 34.35	0.880	22 42 28.6	0.78	0.975 3433	283.8	8.20	0.93	4 21.5
30	6 50 55.64	0.894	22 42 9.6	0.81	0.976 0211	281.0	8.19	0.93	4 17.9
May 1	6 51 17.28	+0.908	+22 41 49.9	−0.83	0.976 6922	+278.2	8.18	0.93	4 14.3
2	6 51 39.24	0.922	22 41 29.7	0.86	0.977 3566	275.4	8.17	0.93	4 10.8
3	6 52 1.53	0.936	22 41 8.8	0.88	0.978 0142	272.5	8.15	0.93	4 7.2
4	6 52 24.15	0.949	22 40 47.3	0.91	0.978 6648	269.6	8.14	0.93	4 3.7
5	6 52 47.08	0.962	22 40 25.1	0.94	0.979 3083	266.6	8.13	0.93	4 0.1
6	6 53 10.33	+0.975	+22 40 2.3	−0.96	0.979 9445	+263.6	8.12	0.92	3 56.6
7	6 53 33.88	0.988	22 39 38.9	0.99	0.980 5734	260.5	8.11	0.92	3 53.0
8	6 53 57.74	1.000	22 39 14.8	1.02	0.981 1948	257.4	8.09	0.92	3 49.5
9	6 54 21.89	1.012	22 38 50.1	1.04	0.981 8087	254.2	8.08	0.92	3 45.9
10	6 54 46.33	1.024	22 38 24.7	1.07	0.982 4149	251.0	8.07	0.92	3 42.4
11	6 55 11.06	+1.036	+22 37 58.7	−1.10	0.983 0134	+247.8	8.06	0.92	3 38.9
12	6 55 36.07	1.048	22 37 32.0	1.13	0.983 6041	244.5	8.05	0.92	3 35.4
13	6 56 1.35	1.059	22 37 4.7	1.15	0.984 1869	241.2	8.04	0.91	3 31.9
14	6 56 26.91	1.070	22 36 36.8	1.18	0.984 7617	237.8	8.03	0.91	3 28.4
15	6 56 52.73	1.081	22 36 8.2	1.21	0.985 3285	234.5	8.02	0.91	3 24.9
16	6 57 18.81	+1.092	+22 35 38.9	−1.23	0.985 8871	+231.1	8.00	0.91	3 21.4
17	6 57 45.15	+1.103	+22 35 9.0	−1.26	0.986 4376	+227.6	7.99	0.91	3 17.9

GREENWICH MEAN TIME.

Date.		Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
		Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
		h m s	s	° ′ ″	″			″	″	h m
May	17	6 57 45.15	+1.103	+22 35 9.0	−1.26	0.986 4376	+227.6	7.99	0.91	3 17.9
	18	6 58 11.74	1.113	22 34 38.5	1.29	0.986 9798	224.2	7.98	0.90	3 14.4
	19	6 58 38.58	1.123	22 34 7.3	1.31	0.987 5138	220.8	7.97	0.90	3 10.9
	20	6 59 5.66	1.133	22 33 35.4	1.34	0.988 0394	217.3	7.96	0.90	3 7.4
	21	6 59 32.97	1.143	22 33 2.9	1.37	0.988 5566	213.7	7.95	0.90	3 3.9
	22	7 0 0.52	+1.153	+22 32 29.8	−1.39	0.989 0652	+210.1	7.94	0.90	3 0.5
	23	7 0 28.31	1.163	22 31 56.0	1.42	0.989 5653	206.5	7.94	0.90	2 57.0
	24	7 0 56.32	1.172	22 31 21.5	1.45	0.990 0566	202.9	7.93	0.90	2 53.5
	25	7 1 24.55	1.181	22 30 46.3	1.48	0.990 5392	199.3	7.92	0.90	2 50.1
	26	7 1 53.00	1.190	22 30 10.5	1.51	0.991 0130	195.6	7.91	0.89	2 46.6
	27	7 2 21.66	+1.199	+22 29 34.0	−1.53	0.991 4779	+191.8	7.90	0.89	2 43.1
	28	7 2 50.54	1.207	22 28 56.9	1.56	0.991 9337	188.0	7.90	0.89	2 39.7
	29	7 3 19.61	1.215	22 28 19.1	1.59	0.992 3805	184.3	7.89	0.89	2 36.2
	30	7 3 48.88	1.224	22 27 40.6	1.62	0.992 8181	180.4	7.88	0.89	2 32.8
	31	7 4 18.34	1.231	22 27 1.5	1.65	0.993 2466	176.6	7.87	0.89	2 29.4
June	1	7 4 47.99	+1.239	+22 26 21.6	−1.68	0.993 6658	+172.7	7.87	0.89	2 25.9
	2	7 5 17.83	1.247	22 25 41.1	1.70	0.994 0756	168.8	7.86	0.89	2 22.5
	3	7 5 47.84	1.254	22 25 0.0	1.73	0.994 4760	164.9	7.85	0.89	2 19.0
	4	7 6 18.02	1.261	22 24 18.2	1.75	0.994 8670	160.9	7.85	0.89	2 15.6
	5	7 6 48.37	1.268	22 23 35.8	1.78	0.995 2485	157.0	7.84	0.89	2 12.2
	6	7 7 18.88	+1.275	+22 22 52.7	−1.81	0.995 6205	+153.0	7.83	0.89	2 8.8
	7	7 7 49.55	1.281	22 22 9.0	1.83	0.995 9829	149.0	7.82	0.89	2 5.3
	8	7 8 20.37	1.287	22 21 24.7	1.86	0.996 3358	145.0	7.82	0.89	2 1.9
	9	7 8 51.34	1.293	22 20 39.7	1.89	0.996 6790	141.0	7.81	0.89	1 58.5
	10	7 9 22.45	1.299	22 19 54.1	1.91	0.997 0126	137.0	7.80	0.89	1 55.1
	11	7 9 53.70	+1.305	+22 19 7.8	−1.94	0.997 3364	+132.9	7.80	0.89	1 51.7
	12	7 10 25.08	1.310	22 18 20.9	1.97	0.997 6505	128.9	7.79	0.89	1 48.3
	13	7 10 56.58	1.315	22 17 33.4	1.99	0.997 9550	124.8	7.79	0.89	1 44.8
	14	7 11 28.21	1.320	22 16 45.3	2.02	0.998 2496	120.7	7.78	0.89	1 41.4
	15	7 11 59.95	1.325	22 15 56.6	2.04	0.998 5345	116.7	7.77	0.88	1 38.0
	16	7 12 31.81	+1.330	+22 15 7.3	−2.07	0.998 8096	+112.6	7.77	0.88	1 34.6
	17	7 13 3.79	1.335	22 14 17.3	2.10	0.999 0749	108.5	7.76	0.88	1 31.2
	18	7 13 35.87	1.339	22 13 26.7	2.12	0.999 3303	104.4	7.76	0.88	1 27.8
	19	7 14 8.05	1.343	22 12 35.5	2.15	0.999 5759	100.3	7.75	0.88	1 24.4
	20	7 14 40.33	1.347	22 11 43.7	2.17	0.999 8115	96.1	7.75	0.88	1 21.0
	21	7 15 12.70	+1.351	+22 10 51.3	−2.19	1.000 0372	+ 92.0	7.74	0.88	1 17.6
	22	7 15 45.17	1.354	22 9 58.4	2.22	1.000 2529	87.8	7.74	0.88	1 14.2
	23	7 16 17.71	1.358	22 9 4.8	2.24	1.000 4586	83.6	7.74	0.88	1 10.9
	24	7 16 50.34	1.361	22 8 10.7	2.27	1.000 6542	79.4	7.74	0.88	1 7.5
	25	7 17 23.05	1.364	22 7 15.9	2.29	1.000 8397	75.2	7.73	0.88	1 4.1
	26	7 17 55.83	+1.367	+22 6 20.6	−2.32	1.001 0151	+ 71.0	7.73	0.88	1 0.7
	27	7 18 28.68	1.370	22 5 24.7	2.34	1.001 1803	66.7	7.73	0.88	0 57.3
	28	7 19 1.59	1.372	22 4 28.3	2.36	1.001 3353	62.5	7.72	0.88	0 53.9
	29	7 19 34.55	1.375	22 3 31.3	2.39	1.001 4801	58.2	7.72	0.88	0 50.5
	30	7 20 7.57	1.377	22 2 33.8	2.41	1.001 6146	53.9	7.72	0.88	0 47.1
July	1	7 20 40.63	+1.379	+22 1 35.7	−2.43	1.001 7389	+ 49.7	7.72	0.88	0 43.7
	2	7 21 13.74	+1.380	+22 0 37.1	−2.45	1.001 8530	+ 45.4	7.71	0.88	0 40.4

SATURN, 1916.

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h m
July 1	7 20 40.63	+1.379	+22 1 35.7	−2.43	1.001 7389	+ 49.7	7.72	0.88	0 43.7
2	7 21 13.74	1.380	22 0 37.1	2.45	1.001 8530	45.4	7.71	0.88	0 40.4
3	7 21 46.88	1.381	21 59 38.0	2.48	1.001 9567	41.1	7.71	0.88	0 37.0
4	7 22 20.06	1.383	21 58 38.3	2.50	1.002 0502	36.8	7.71	0.88	0 33.6
5	7 22 53.27	1.384	21 57 38.2	2.51	1.002 1333	32.5	7.71	0.87	0 30.2
6	7 23 26.50	+1.385	+21 56 37.6	−2.54	1.002 2061	+ 28.2	7.71	0.87	0 26.9
7	7 23 59.74	1.385	21 55 36.5	2.56	1.002 2686	23.9	7.70	0.87	0 23.5
8	7 24 33.00	1.386	21 54 34.9	2.58	1.002 3209	19.6	7.70	0.87	0 20.1
9	7 25 6.27	1.386	21 53 32.9	2.59	1.002 3628	15.3	7.70	0.87	0 16.7
10	7 25 39.54	1.386	21 52 30.4	2.61	1.002 3945	11.1	7.70	0.87	0 13.3
11	7 26 12.82	+1.386	+21 51 27.4	−2.63	1.002 4160	+ 6.8	7.70	0.87	0 9.9
12	7 26 46.08	1.386	21 50 24.1	2.65	1.002 4272	+ 2.5	7.70	0.87	0 6.6
13	7 27 19.34	1.385	21 49 20.3	2.67	1.002 4281	− 1.8	7.70	0.87	{ 0 3.2 23 59.8
14	7 27 52.58	1.385	21 48 16.1	2.69	1.002 4188	6.0	7.70	0.87	23 56.4
15	7 28 25.81	1.384	21 47 11.4	2.70	1.002 3992	10.3	7.71	0.87	23 53.0
16	7 28 59.02	+1.383	+21 46 6.4	−2.72	1.002 3695	− 14.5	7.71	0.87	23 49.6
17	7 29 32.21	1.382	21 45 1.0	2.73	1.002 3295	18.8	7.71	0.87	23 46.3
18	7 30 5.37	1.381	21 43 55.2	2.75	1.002 2794	23.0	7.71	0.87	23 42.9
19	7 30 38.50	1.380	21 42 49.0	2.76	1.002 2191	27.3	7.71	0.87	23 39.5
20	7 31 11.59	1.378	21 41 42.5	2.78	1.002 1485	31.5	7.71	0.87	23 36.1
21	7 31 44.64	+1.376	+21 40 35.7	−2.79	1.002 0677	− 35.8	7.71	0.87	23 32.7
22	7 32 17.65	1.374	21 39 28.5	2.81	1.001 9766	40.1	7.72	0.87	23 29.3
23	7 32 50.60	1.372	21 38 20.9	2.82	1.001 8752	44.4	7.72	0.87	23 26.0
24	7 33 23.51	1.370	21 37 13.1	2.83	1.001 7636	48.7	7.72	0.87	23 22.6
25	7 33 56.35	1.367	21 36 4.9	2.85	1.001 6416	53.0	7.72	0.88	23 19.2
26	7 34 29.13	+1.365	+21 34 56.4	−2.86	1.001 5094	− 57.2	7.72	0.88	23 15.8
27	7 35 1.85	1.362	21 33 47.7	2.87	1.001 3670	61.5	7.73	0.88	23 12.4
28	7 35 34.49	1.358	21 32 38.7	2.88	1.001 2143	65.8	7.73	0.88	23 9.0
29	7 36 7.05	1.355	21 31 29.5	2.89	1.001 0514	70.0	7.73	0.88	23 5.6
30	7 36 39.53	1.351	21 30 20.1	2.90	1.000 8782	74.3	7.73	0.88	23 2.2
31	7 37 11.92	+1.348	+21 29 10.4	−2.91	1.000 6949	− 78.5	7.74	0.88	22 58.8
Aug. 1	7 37 44.23	1.344	21 28 0.5	2.91	1.000 5013	82.8	7.74	0.88	22 55.4
2	7 38 16.43	1.340	21 26 50.5	2.92	1.000 2976	87.0	7.75	0.88	22 52.0
3	7 38 48.53	1.335	21 25 40.3	2.93	1.000 0837	91.2	7.75	0.88	22 48.6
4	7 39 20.53	1.331	21 24 29.9	2.94	0.999 8598	95.4	7.75	0.88	22 45.2
5	7 39 52.41	+1.326	+21 23 19.4	−2.94	0.999 6258	− 99.6	7.76	0.88	22 41.8
6	7 40 24.18	1.321	21 22 8.8	2.94	0.999 3819	103.7	7.76	0.88	22 38.4
7	7 40 55.83	1.316	21 20 58.1	2.95	0.999 1280	107.8	7.77	0.88	22 35.0
8	7 41 27.35	1.311	21 19 47.3	2.95	0.998 8643	112.0	7.77	0.88	22 31.6
9	7 41 58.74	1.305	21 18 36.4	2.95	0.998 5906	116.1	7.77	0.88	22 28.2
10	7 42 30.00	+1.300	+21 17 25.5	−2.96	0.998 3071	−120.2	7.78	0.88	22 24.8
11	7 43 1.13	1.294	21 16 14.5	2.96	0.998 0138	124.3	7.78	0.88	22 21.3
12	7 43 32.11	1.288	21 15 3.5	2.96	0.997 7107	128.3	7.79	0.88	22 17.9
13	7 44 2.95	1.282	21 13 52.4	2.96	0.997 3980	132.3	7.79	0.88	22 14.5
14	7 44 33.64	1.276	21 12 41.4	2.96	0.997 0756	136.3	7.80	0.89	22 11.1
15	7 45 4.18	+1.269	+21 11 30.4	−2.96	0.996 7436	−140.3	7.80	0.89	22 7.7
16	7 45 34.57	+1.263	+21 10 19.4	−2.96	0.996 4020	−144.4	7.81	0.89	22 4 2

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″			″	″	h m
ug. 16	7 45 34.57	+1.263	+21 10 19.4	−2.96	0.996 4020	−144.4	7.81	0.89	22 4.2
17	7 46 4.79	1.256	21 9 8.5	2.95	0.996 0507	148.4	7.81	0.89	22 0.8
18	7 46 34.85	1.249	21 7 57.6	2.95	0.995 6899	152.3	7.82	0.89	21 57.3
19	7 47 4.74	1.242	21 6 46.8	2.95	0.995 3195	156.3	7.83	0.89	21 53.9
20	7 47 34.46	1.235	21 5 36.1	2.94	0.994 9396	160.3	7.84	0.89	21 50.5
21	7 48 4.00	+1.227	+21 4 25.5	−2.94	0.994 5501	−164.3	7.84	0.89	21 47.0
22	7 48 33.35	1.219	21 3 15.0	2.93	0.994 1512	168.2	7.85	0.89	21 43.6
23	7 49 2.52	1.211	21 2 4.7	2.93	0.993 7428	172.1	7.86	0.89	21 40.1
24	7 49 31.49	1.203	21 0 54.6	2.92	0.993 3251	176.0	7.87	0.90	21 36.7
25	7 50 0.26	1.195	20 59 44.7	2.91	0.992 8981	179.9	7.88	0.90	21 33.2
26	7 50 28.83	+1.186	+20 58 35.0	−2.90	0.992 4618	−183.7	7.88	0.90	21 29.7
27	7 50 57.19	1.178	20 57 25.6	2.89	0.992 0163	187.5	7.89	0.90	21 26.3
28	7 51 25.35	1.169	20 56 16.4	2.88	0.991 5616	191.3	7.90	0.90	21 22.8
29	7 51 53.28	1.159	20 55 7.4	2.87	0.991 0980	195.1	7.91	0.90	21 19.3
30	7 52 20.99	1.150	20 53 58.8	2.85	0.990 6253	198.8	7.92	0.90	21 15.9
31	7 52 48.47	+1.140	+20 52 50.5	−2.84	0.990 1437	−202.5	7.93	0.90	21 12.4
ept. 1	7 53 15.73	1.131	20 51 42.6	2.82	0.989 6533	206.1	7.94	0.90	21 8.9
2	7 53 42.74	1.120	20 50 35.0	2.81	0.989 1542	209.8	7.95	0.90	21 5.4
3	7 54 9.51	1.110	20 49 27.7	2.79	0.988 6464	213.4	7.95	0.91	21 1.9
4	7 54 36.04	1.100	20 48 20.9	2.78	0.988 1300	217.0	7.96	0.91	20 58.4
5	7 55 2.32	+1.090	+20 47 14.5	−2.76	0.987 6050	−220.5	7.97	0.91	20 54.9
6	7 55 28.34	1.079	20 46 8.6	2.74	0.987 0717	223.9	7.98	0.91	20 51.4
7	7 55 54.11	1.068	20 45 3.1	2.72	0.986 5301	227.4	7.99	0.91	20 47.9
8	7 56 19.61	1.057	20 43 58.1	2.70	0.985 9802	230.8	8.00	0.91	20 44.4
9	7 56 44.84	1.046	20 42 53.6	2.68	0.985 4221	234.2	8.01	0.91	20 40.9
10	7 57 9.81	+1.035	+20 41 49.7	−2.65	0.984 8560	−237.5	8.02	0.91	20 37.4
11	7 57 34.50	1.023	20 40 46.2	2.63	0.984 2819	240.8	8.03	0.91	20 33.9
12	7 57 58.92	1.011	20 39 43.3	2.61	0.983 7000	244.1	8.04	0.91	20 30.3
13	7 58 23.05	1.000	20 38 41.0	2.59	0.983 1102	247.4	8.06	0.92	20 26.8
14	7 58 46.90	0.988	20 37 39.2	2.56	0.982 5127	250.5	8.07	0.92	20 23.2
15	7 59 10.45	+0.975	+20 36 38.1	−2.53	0.981 9076	−253.7	8.08	0.92	20 19.7
16	7 59 33.71	0.963	20 35 37.6	2.51	0.981 2949	256.9	8.09	0.92	20 16.1
17	7 59 56.68	0.951	20 34 37.8	2.48	0.980 6747	260.0	8.10	0.92	20 12.6
18	8 0 19.34	0.938	20 33 38.7	2.45	0.980 0470	263.0	8.11	0.92	20 9.0
19	8 0 41.69	0.925	20 32 40.2	2.42	0.979 4121	266.0	8.12	0.92	20 5.5
20	8 1 3.73	+0.911	+20 31 42.4	−2.39	0.978 7700	−269.0	8.14	0.92	20 1.9
21	8 1 25.44	0.898	20 30 45.4	2.36	0.978 1209	271.9	8.15	0.92	19 58.3
22	8 1 46.84	0.885	20 29 49.2	2.32	0.977 4648	274.8	8.16	0.92	19 54.7
23	8 2 7.90	0.871	20 28 53.8	2.29	0.976 8018	277.6	8.17	0.93	19 51.2
24	8 2 28.64	0.857	20 27 59.2	2.26	0.976 1321	280.4	8.18	0.93	19 47.6
25	8 2 49.03	+0.843	+20 27 5.5	−2.22	0.975 4557	−283.2	8.20	0.93	19 44.0
26	8 3 9.09	0.829	20 26 12.6	2.19	0.974 7729	285.8	8.21	0.93	19 40.4
27	8 3 28.80	0.814	20 25 20.5	2.15	0.974 0837	288.4	8.22	0.93	19 36.8
28	8 3 48.15	0.799	20 24 29.4	2.11	0.973 3884	291.0	8.23	0.93	19 33.2
29	8 4 7.15	0.784	20 23 39.2	2.07	0.972 6871	293.4	8.25	0.93	19 29.5
30	8 4 25.79	+0.769	+20 22 49.9	−2.03	0.971 9799	−295.9	8.26	0.94	19 25.9
ct. 1	8 4 44.07	+0.754	+20 22 1.6	−1.99	0.971 2670	−298.4	8.28	0.94	19 22.2

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h m
Oct. 1	8 4 44.07	+0.754	+20 22 1.6	−1.99	0.971 2670	−298.4	8.28	0.94	19 22.2
2	8 5 1.98	0.739	20 21 14.3	1.95	0.970 5485	300.5	8.29	0.94	19 18.6
3	8 5 19.52	0.723	20 20 28.0	1.91	0.969 8246	302.7	8.30	0.94	19 15.0
4	8 5 36.68	0.707	20 19 42.7	1.86	0.969 0955	304.9	8.32	0.94	19 11.3
5	8 5 53.47	0.691	20 18 58.5	1.82	0.968 3613	306.9	8.33	0.95	19 7.7
6	8 6 9.87	+0.675	+20 18 15.3	−1.78	0.967 6222	−308.9	8.35	0.95	19 4.0
7	8 6 25.89	0.659	20 17 33.2	1.73	0.966 8784	310.9	8.36	0.95	19 0.3
8	8 6 41.52	0.643	20 16 52.1	1.69	0.966 1300	312.8	8.37	0.95	18 56.6
9	8 6 56.76	0.627	20 16 12.2	1.64	0.965 3770	314.6	8.39	0.95	18 53.0
10	8 7 11.60	0.610	20 15 33.4	1.59	0.964 6198	316.3	8.40	0.95	18 49.3
11	8 7 26.05	+0.594	+20 14 55.7	−1.55	0.963 8586	−318.0	8.42	0.95	18 45.6
12	8 7 40.09	0.577	20 14 19.2	1.50	0.963 0934	319.6	8.43	0.95	18 41.9
13	8 7 53.73	0.560	20 13 43.8	1.45	0.962 3245	321.1	8.45	0.96	18 38.2
14	8 8 6.96	0.543	20 13 9.7	1.40	0.961 5519	322.6	8.46	0.96	18 34.4
15	8 8 19.78	0.525	20 12 36.7	1.35	0.960 7759	324.0	8.48	0.96	18 30.7
16	8 8 32.18	+0.508	+20 12 5.0	−1.30	0.959 9967	−325.3	8.49	0.96	18 27.0
17	8 8 44.16	0.490	20 11 34.5	1.24	0.959 2143	326.6	8.51	0.96	18 23.3
18	8 8 55.72	0.473	20 11 5.3	1.19	0.958 4290	327.8	8.53	0.96	18 19.5
19	8 9 6.85	0.455	20 10 37.4	1.14	0.957 6410	328.9	8.54	0.96	18 15.8
20	8 9 17.55	0.437	20 10 10.7	1.08	0.956 8505	329.9	8.56	0.97	18 12.0
21	8 9 27.82	+0.419	+20 9 45.4	−1.03	0.956 0577	−330.8	8.57	0.97	18 8.2
22	8 9 37.65	0.400	20 9 21.4	0.97	0.955 2628	331.6	8.59	0.97	18 4.4
23	8 9 47.04	0.382	20 8 58.7	0.92	0.954 4661	332.3	8.61	0.97	18 0.6
24	8 9 55.98	0.363	20 8 37.4	0.86	0.953 6677	333.0	8.62	0.97	17 56.9
25	8 10 4.48	0.345	20 8 17.5	0.80	0.952 8679	333.5	8.64	0.98	17 53.1
26	8 10 12.53	+0.326	+20 7 58.9	−0.74	0.952 0670	−333.9	8.65	0.98	17 49.3
27	8 10 20.12	0.307	20 7 41.8	0.69	0.951 2651	334.3	8.67	0.98	17 45.5
28	8 10 27.27	0.288	20 7 26.0	0.63	0.950 4626	334.5	8.69	0.98	17 41.7
29	8 10 33.96	0.269	20 7 11.7	0.56	0.949 6596	334.6	8.70	0.98	17 37.8
30	8 10 40.19	0.250	20 6 58.9	0.50	0.948 8565	334.6	8.72	0.99	17 34.0
31	8 10 45.96	+0.231	+20 6 47.5	−0.45	0.948 0535	−334.5	8.73	0.99	17 30.2
Nov. 1	8 10 51.27	0.212	20 6 37.5	0.39	0.947 2508	334.3	8.75	0.99	17 26.3
2	8 10 56.12	0.192	20 6 28.8	0.33	0.946 4487	334.0	8.77	0.99	17 22.4
3	8 11 0.50	0.173	20 6 21.7	0.26	0.945 6474	333.6	8.78	0.99	17 18.6
4	8 11 4.42	0.154	20 6 16.1	0.21	0.944 8473	333.1	8.80	1.00	17 14.7
5	8 11 7.88	+0.135	+20 6 11.8	−0.15	0.944 0484	−332.5	8.81	1.00	17 10.8
6	8 11 10.88	0.115	20 6 9.1	0.08	0.943 2512	331.8	8.83	1.00	17 6.9
7	8 11 13.41	0.096	20 6 7.8	−0.02	0.942 4558	331.0	8.85	1.00	17 3.0
8	8 11 15.47	0.076	20 6 8.0	+0.04	0.941 6624	330.1	8.86	1.00	16 59.2
9	8 11 17.07	0.057	20 6 9.7	0.10	0.940 8714	329.1	8.88	1.01	16 55.2
10	8 11 18.20	+0.037	+20 6 12.8	+0.16	0.940 0829	−328.0	8.89	1.01	16 51.3
11	8 11 18.86	+0.018	20 6 17.4	0.22	0.939 2972	326.7	8.91	1.01	16 47.4
12	8 11 19.06	−0.002	20 6 23.5	0.28	0.938 5146	325.4	8.93	1.01	16 43.4
13	8 11 18.78	0.021	20 6 31.0	0.34	0.937 7354	323.9	8.94	1.01	16 39.5
14	8 11 18.04	0.041	20 6 40.0	0.41	0.936 9597	322.4	8.96	1.02	16 35.5
15	8 11 16.83	−0.060	+20 6 50.5	+0.47	0.936 1878	−320.7	8.97	1.02	16 31.6
16	*8 11 15.15*	*−0.080*	+20 7 2.4	+0.53	0.935 4201	−318.9	8.99	1.02	16 27.6

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi-diameter.	Hor. Paral-lax.	Transit, Meridian of Greenwich.
	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″			″	″	h m
Nov. 16	8 11 15.15	−0.080	+20 7 2.4	+0.53	0.935 4201	−318.9	8.99	1.02	16 27.6
17	8 11 13.01	0.099	20 7 15.9	0.59	0.934 6569	317.0	9.01	1.02	16 23.7
18	8 11 10.39	0.119	20 7 30.8	0.65	0.933 8983	315.0	9.02	1.02	16 19.7
19	8 11 7.31	0.138	20 7 47.2	0.71	0.933 1448	312.9	9.04	1.03	16 15.7
20	8 11 3.76	0.158	20 8 5.1	0.78	0.932 3966	310.6	9.05	1.03	16 11.7
21	8 10 59.74	−0.177	+20 8 24.4	+0.84	0.931 6539	−308.2	9.07	1.03	16 7.7
22	8 10 55.27	0.196	20 8 45.2	0.90	0.930 9172	305.7	9.08	1.03	16 3.7
23	8 10 50.33	0.216	20 9 7.4	0.96	0.930 1866	303.1	9.10	1.03	15 59.6
24	8 10 44.92	0.235	20 9 31.1	1.01	0.929 4625	300.3	9.11	1.04	15 55.6
25	8 10 39.06	0.254	20 9 56.1	1.07	0.928 7452	297.4	9.13	1.04	15 51.6
26	8 10 32.75	−0.272	+20 10 22.6	+1.13	0.928 0350	−294.4	9.14	1.04	15 47.6
27	8 10 25.99	0.291	20 10 50.5	1.19	0.927 3323	291.2	9.15	1.04	15 43.5
28	8 10 18.78	0.310	20 11 19.8	1.25	0.926 6374	287.9	9.17	1.04	15 39.4
29	8 10 11.12	0.328	20 11 50.5	1.31	0.925 9505	284.5	9.18	1.04	15 35.4
30	8 10 3.03	0.346	20 12 22.5	1.36	0.925 2719	281.0	9.20	1.04	15 31.3
Dec. 1	8 9 54.50	−0.365	+20 12 55.8	+1.41	0.924 6019	−277.3	9.21	1.04	15 27.2
2	8 9 45.53	0.383	20 13 30.4	1.47	0.923 9409	273.5	9.22	1.05	15 23.2
3	8 9 36.14	0.400	20 14 6.3	1.52	0.923 2889	269.7	9.24	1.05	15 19.1
4	8 9 26.33	0.418	20 14 43.5	1.58	0.922 6464	265.7	9.25	1.05	15 15.0
5	8 9 16.10	0.435	20 15 21.9	1.63	0.922 0135	261.6	9.27	1.05	15 10.9
6	8 9 5.47	−0.452	+20 16 1.5	+1.68	0.921 3906	−257.4	9.28	1.05	15 6.7
7	8 8 54.42	0.469	20 16 42.4	1.73	0.920 7780	253.1	9.29	1.05	15 2.6
8	8 8 42.98	0.485	20 17 24.4	1.78	0.920 1758	248.7	9.30	1.05	14 58.5
9	8 8 31.14	0.502	20 18 7.6	1.82	0.919 5843	244.2	9.32	1.06	14 54.4
10	8 8 18.90	0.518	20 18 51.9	1.87	0.919 0038	239.5	9.33	1.06	14 50.2
11	8 8 6.29	−0.533	+20 19 37.3	+1.91	0.918 4345	−234.8	9.34	1.06	14 46.1
12	8 7 53.30	0.549	20 20 23.8	1.96	0.917 8767	230.0	9.35	1.06	14 41.9
13	8 7 39.93	0.565	20 21 11.4	2.00	0.917 3306	225.0	9.36	1.06	14 37.8
14	8 7 26.20	0.580	20 22 0.0	2.05	0.916 7965	220.0	9.38	1.07	14 33.6
15	8 7 12.11	0.595	20 22 49.7	2.09	0.916 2747	214.8	9.39	1.07	14 29.4
16	8 6 57.66	−0.609	+20 23 40.3	+2.13	0.915 7654	−209.5	9.40	1.07	14 25.3
17	8 6 42.87	0.623	20 24 31.9	2.17	0.915 2689	204.1	9.41	1.07	14 21.1
18	8 6 27.74	0.637	20 25 24.4	2.21	0.914 7855	198.6	9.42	1.07	14 16.9
19	8 6 12.28	0.651	20 26 17.8	2.24	0.914 3154	193.0	9.43	1.07	14 12.7
20	8 5 56.50	0.664	20 27 12.1	2.28	0.913 8589	187.4	9.44	1.07	14 8.5
21	8 5 40.40	−0.677	+20 28 7.2	+2.31	0.913 4161	−181.6	9.45	1.07	14 4.3
22	8 5 23.99	0.690	20 29 3.2	2.35	0.912 9873	175.7	9.46	1.08	14 0.1
23	8 5 7.28	0.702	20 29 59.9	2.38	0.912 5728	169.7	9.47	1.08	13 55.9
24	8 4 50.29	0.714	20 30 57.4	2.41	0.912 1727	163.6	9.48	1.08	13 51.7
25	8 4 33.02	0.725	20 31 55.6	2.44	0.911 7873	157.5	9.49	1.08	13 47.5
26	8 4 15.48	−0.736	+20 32 54.5	+2.47	0.911 4168	−151.2	9.50	1.08	13 43.2
27	8 3 57.69	0.746	20 33 54.0	2.49	0.911 0614	144.9	9.51	1.08	13 39.0
28	8 3 39.65	0.757	20 34 54.0	2.51	0.910 7212	138.5	9.51	1.08	13 34.8
29	8 3 21.37	0.766	20 35 54.6	2.54	0.910 3966	132.0	9.52	1.08	13 30.5
30	8 3 2.87	0.775	20 36 55.7	2.56	0.910 0876	125.5	9.52	1.08	13 26.3
31	8 2 44.16	−0.784	+20 37 57.3	+2.58	0.909 7943	−118.9	9.53	1.08	13 22.1
32	8 2 25.24		+20 38 59.3	. .	0.909 5168	. . .	9.54	1.09	13 17.8

FOR GREENWICH MEAN NOON.

Date.	Heliocentric Longitude. Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
	° ′ ″	′ ″	″	° ′ ″	″		
Jan. 7	103 7 35.3	2 14.48	−32.7	−0 25 33.3	+5.76	0.955 3942	+31.3
15	103 25 31.1	2 14.47	31.8	0 24 47.2	5.76	0.955 4196	32.1
23	103 43 26.8	2 14.45	30.8	0 24 1.1	5.77	0.955 4456	32.9
31	104 1 22.3	2 14.44	29.9	0 23 14.9	5.78	0.955 4722	33.6
Feb. 8	104 19 17.8	2 14.43	28.9	0 22 28.7	5.78	0.955 4994	34.4
16	104 37 13.1	2 14.41	−27.9	−0 21 42.5	+5.78	0.955 5273	+35.2
24	104 55 8.3	2 14.39	26.9	0 20 56.2	5.79	0.955 5557	35.9
Mar. 3	105 13 3.4	2 14.37	26.0	0 20 9.9	5.79	0.955 5847	36.6
11	105 30 58.3	2 14.35	25.0	0 19 23.6	5.79	0.955 6142	37.3
19	105 48 53.0	2 14.34	24.0	0 18 37.3	5.79	0.955 6444	38.1
27	106 6 47.7	2 14.33	−23.0	−0 17 50.9	+5.80	0.955 6752	+38.8
Apr. 4	106 24 42.2	2 14.31	22.0	0 17 4.5	5.80	0.955 7065	39.6
12	106 42 36.6	2 14.29	21.0	0 16 18.1	5.80	0.955 7385	40.3
20	107 0 30.8	2 14.26	20.0	0 15 31.7	5.81	0.955 7710	41.1
28	107 18 24.8	2 14.24	19.0	0 14 45.2	5.81	0.955 8042	41.8
May 6	107 36 18.7	2 14.23	−18.0	−0 13 58.7	+5.81	0.955 8379	+42.6
14	107 54 12.5	2 14.21	17.0	0 13 12.2	5.81	0.955 8723	43.4
22	108 12 6.1	2 14.19	16.0	0 12 25.7	5.81	0.955 9073	44.1
30	108 29 59.5	2 14.16	15.0	0 11 39.2	5.81	0.955 9428	44.8
June 7	108 47 52.7	2 14.14	14.0	0 10 52.7	5.82	0.955 9789	45.6
15	109 5 45.8	2 14.12	−13.0	−0 10 6.1	+5.82	0.956 0157	+46.3
23	109 23 38.7	2 14.10	12.0	0 9 19.6	5.82	0.956 0530	47.1
July 1	109 41 31.4	2 14.08	11.0	0 8 33.1	5.82	0.956 0910	47.8
9	109 59 24.0	2 14.06	10.0	0 7 46.5	5.82	0.956 1295	48.6
17	110 17 16.4	2 14.04	9.0	0 7 0.0	5.82	0.956 1687	49.3
25	110 35 8.6	2 14.01	− 8.0	−0 6 13.4	+5.82	0.956 2084	+50.1
Aug. 2	110 53 0.6	2 13.99	7.0	0 5 26.9	5.82	0.956 2488	50.8
10	111 10 52.4	2 13.97	6.0	0 4 40.3	5.82	0.956 2897	51.6
18	111 28 44.1	2 13.95	4.9	0 3 53.8	5.82	0.956 3313	52.3
26	111 46 35.6	2 13.92	3.9	0 3 7.2	5.82	0.956 3734	53.0
Sept. 3	112 4 26.9	2 13.90	− 2.9	−0 2 20.7	+5.82	0.956 4161	+53.7
11	112 22 18.0	2 13.87	1.9	0 1 34.1	5.82	0.956 4594	54.4
19	112 40 8.9	2 13.84	− 0.9	0 0 47.6	5.82	0.956 5032	55.2
27	112 57 59.5	2 13.82	+ 0.1	−0 0 1.0	5.82	0.956 5477	55.9
Oct. 5	113 15 50.0	2 13.80	1.1	+0 0 45.5	5.81	0.956 5927	56.6
13	113 33 40.3	2 13.77	+ 2.2	+0 1 32.0	+5.81	0.956 6382	+57.3
21	113 51 30.3	2 13.74	3.2	0 2 18.5	5.81	0.956 6844	58.1
29	114 9 20.1	2 13.72	4.2	0 3 5.0	5.81	0.956 7312	58.8
Nov. 6	114 27 9.8	2 13.69	5.2	0 3 51.5	5.81	0.956 7785	59.4
14	114 44 59.2	2 13.66	6.2	0 4 37.9	5.81	0.956 8263	60.1
22	115 2 48.4	2 13.64	+ 7.2	+0 5 24.4	+5.81	0.956 8747	+60.9
30	115 20 37.4	2 13.61	8.2	0 6 10.8	5.80	0.956 9237	61.6
Dec. 8	115 38 26.1	2 13.58	9.2	0 6 57.2	5.80	0.956 9732	62.3
16	115 56 14.7	2 13.55	10.2	0 7 43.6	5.79	0.957 0233	62.9
24	116 14 2.9	2 13.52	11.2	0 8 29.9	5.79	0.957 0739	63.6
32	116 31 51.0	2 13.49	+12.2	+0 9 16.3	+5.79	0.957 1250	+64.3
40	116 49 38.8	2 13.46	+13.2	+0 10 2.6	+5.79	0.957 1767	+65.0

GREENWICH MEAN TIME.

Date.		Apparent Right Ascension.	Var. per Day.	Apparent Declination.	Var. per Day.	Logarithm of Distance from Earth.	Var. per Day.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
		Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	
		h m s	s	° ′ ″	″			″	″	h m
Jan.	1	21 5 30.73	+12.157	−17 20 39.6	+53.26	1.316 7273	+2045.1	1.62	0.42	2 25.9
	5	21 6 20.15	12.543	17 17 2.9	55.05	1.317 5041	1836.8	1.61	0.42	2 11.0
	9	21 7 11.01	12.880	17 13 19.5	56.61	1.318 1960	1621.3	1.61	0.42	1 56.1
	13	21 8 3.13	13.170	17 9 30.3	57.96	1.318 8005	1401.2	1.61	0.42	1 41.2
	17	21 8 56.31	13.410	17 5 36.1	59.13	1.319 3164	1177.0	1.61	0.42	1 26.4
	21	21 9 50.35	+13.607	−17 1 37.5	+60.12	1.319 7416	+ 948.8	1.61	0.42	1 11.5
	25	21 10 45.10	13.759	16 57 35.3	60.94	1.320 0751	718.3	1.60	0.42	0 56.7
	29	21 11 40.36	13.864	16 53 30.3	61.54	1.320 3159	484.9	1.60	0.42	0 41.9
Feb.	2	21 12 35.95	13.921	16 49 23.3	61.94	1.320 4627	248.9	1.60	0.42	0 27.1
	6	21 13 31.67	13.931	16 45 15.1	62.10	1.320 5149	+ 11.9	1.60	0.42	0 12.3
	10	21 14 27.33	+13.888	−16 41 6.8	+62.03	1.320 4724	− 223.8	1.60	0.42	23 53.8
	14	21 15 22.71	13.797	16 36 59.1	61.77	1.320 3362	456.8	1.60	0.42	23 39.0
	18	21 16 17.65	13.666	16 32 52.9	61.31	1.320 1074	686.9	1.60	0.42	23 24.2
	22	21 17 11.98	13.490	16 28 48.9	60.64	1.319 7871	914.0	1.61	0.42	23 9.3
	26	21 18 5.51	13.271	16 24 48.1	59.74	1.319 3766	1138.4	1.61	0.42	22 54.5
Mar.	1	21 18 58.09	+13.009	−16 20 51.2	+58.66	1.318 8769	−1359.1	1.61	0.42	22 39.6
	5	21 19 49.52	12.698	16 16 59.1	57.35	1.318 2900	1574.4	1.61	0.42	22 24.7
	9	21 20 39.62	12.345	16 13 12.7	55.80	1.317 6183	1782.5	1.61	0.42	22 9.8
	13	21 21 28.23	11.953	16 9 33.0	54.04	1.316 8651	1982.2	1.62	0.43	21 54.9
	17	21 22 15.19	11.522	16 6 0.6	52.13	1.316 0337	2173.4	1.62	0.43	21 40.0
	21	21 23 0.36	+11.057	−16 2 36.2	+50.04	1.315 1275	−2356.3	1.62	0.43	21 25.0
	25	21 23 43.60	10.558	15 59 20.5	47.77	1.314 1498	2531.0	1.63	0.43	21 10.0
	29	21 24 24.78	10.025	15 56 14.3	45.29	1.313 1039	2696.9	1.63	0.43	20 54.9
Apr.	2	21 25 3.75	9.453	15 53 18.4	42.64	1.311 9938	2851.1	1.63	0.43	20 39.8
	6	21 25 40.36	8.850	15 50 33.4	39.81	1.310 8246	2993.1	1.63	0.43	20 24.7
	10	21 26 14.51	+ 8.219	−15 48 0.1	+36.83	1.309 6010	−3122.4	1.64	0.43	20 9.5
	14	21 26 46.08	7.562	15 45 38.9	33.73	1.308 3284	3238.4	1.65	0.43	19 54.3
	18	21 27 14.98	6.884	15 43 30.4	30.53	1.307 0120	3341.2	1.65	0.43	19 39.0
	22	21 27 41.13	6.188	15 41 34.8	27.22	1.305 6572	3430.8	1.66	0.44	19 23.7
	26	21 28 4.46	5.471	15 39 52.8	23.78	1.304 2691	3507.5	1.66	0.44	19 8.4
	30	21 28 24.87	+ 4.731	−15 38 24.7	+20.24	1.302 8532	−3569.3	1.67	0.44	18 53.0
May	4	21 28 42.29	3.975	15 37 11.0	16.61	1.301 4159	3614.0	1.67	0.44	18 37.5
	8	21 28 56.66	3.211	15 36 11.9	12.93	1.299 9642	3642.1	1.68	0.44	18 22.1
	12	21 29 7.97	2.442	15 35 27.6	9.24	1.298 5044	3653.7	1.69	0.44	18 6.5
	16	21 29 16.19	1.669	15 34 58.0	5.55	1.297 0434	3649.0	1.69	0.44	17 50.9
	20	21 29 21.32	+ 0.896	−15 34 43.2	+ 1.85	1.295 5872	−3629.5	1.70	0.45	17 35.3
	24	21 29 23.36	+ 0.124	15 34 43.2	− 1.85	1.294 1420	3593.4	1.70	0.45	17 19.6
	28	21 29 22.31	− 0.649	15 34 58.0	5.53	1.292 7148	3539.8	1.71	0.45	17 3.8
June	1	21 29 18.18	1.414	15 35 27.4	9.18	1.291 3125	3469.0	1.71	0.45	16 48.0
	5	21 29 11.02	2.164	15 36 11.3	12.74	1.289 9421	3379.3	1.72	0.45	16 32.1
	9	21 29 0.89	− 2.896	−15 37 9.1	−16.14	1.288 6113	−3272.6	1.72	0.45	16 16.2
	13	21 28 47.88	3.604	15 38 20.3	19.46	1.287 3261	3150.7	1.73	0.45	16 0.3
	17	21 28 32.09	4.288	15 39 44.6	22.64	1.286 0928	3013.4	1.74	0.46	15 44.3
	21	21 28 13.61	4.947	15 41 21.2	25.68	1.284 9174	2861.2	1.74	0.46	15 28.2
	25	21 27 52.55	5.578	15 43 9.7	28.56	1.283 8059	2693.2	1.74	0.46	15 12.2
	29	21 27 29.03	− 6.177	−15 45 9.4	−31.25	1.282 7649	−2509.3	1.75	0.46	14 56.0
July	3	21 27 3.19	− 6.734	−15 47 19.4	−33.71	1.281 8004	−2311.0	1.75	0.46	14 39.9

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Day.	Apparent Declination.	Var. per Day.	Logarithm of Distance from Earth.	Var. per Day.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″			″	″	h m
July 3	21 27 3.19	− 6.734	−15 47 19.4	−33.71	1.281 8004	−2311.0	1.75	0.46	14 39.9
7	21 26 35.22	7.244	15 49 38.8	35.96	1.280 9178	2100.2	1.76	0.46	14 23.7
11	21 26 5.30	7.708	15 52 6.7	37.92	1.280 1218	1877.4	1.76	0.46	14 7.4
15	21 25 33.62	8.122	15 54 41.9	39.64	1.279 4172	1645.0	1.76	0.46	13 51.2
19	21 25 0.39	8.488	15 57 23.5	41.14	1.278 8069	1404.6	1.76	0.46	13 34.9
23	21 24 25.78	− 8.806	−16 0 10.7	−42.39	1.278 2948	−1154.3	1.77	0.47	13 18.6
27	21 23 50.02	9.064	16 3 2.2	43.32	1.277 8846	895.5	1.77	0.47	13 2.3
31	21 23 13.35	9.260	16 5 56.9	43.96	1.277 5793	630.1	1.77	0.47	12 45.9
Aug. 4	21 22 36.02	9.395	16 8 53.5	44.30	1.277 3810	361.2	1.77	0.47	12 29.6
8	21 21 58.27	9.468	16 11 50.9	44.34	1.277 2906	− 90.5	1.77	0.47	12 13.2
12	21 21 20.36	− 9.478	−16 14 47.8	−44.08	1.277 3087	+ 180.8	1.77	0.47	11 56.9
16	21 20 42.53	9.427	16 17 43.2	43.57	1.277 4351	450.8	1.77	0.47	11 40.5
20	21 20 5.02	9.319	16 20 36.0	42.77	1.277 6692	719.5	1.77	0.47	11 24.2
24	21 19 28.06	9.148	16 23 25.0	41.70	1.278 0105	986.6	1.77	0.47	11 7.9
28	21 18 51.92	8.913	16 26 9.2	40.35	1.278 4579	1249.3	1.77	0.47	10 51.5
Sept. 1	21 18 16.84	− 8.614	−16 28 47.4	−38.71	1.279 0090	+1504.7	1.76	0.46	10 35.2
5	21 17 43.09	8.254	16 31 18.5	36.80	1.279 6605	1750.9	1.76	0.46	10 18.9
9	21 17 10.88	7.844	16 33 41.5	34.68	1.280 4084	1986.7	1.76	0.46	10 2.7
13	21 16 40.41	7.381	16 35 55.7	32.37	1.281 2484	2211.7	1.75	0.46	9 46.4
17	21 16 11.90	6.869	16 38 0.2	29.84	1.282 1763	2425.9	1.75	0.46	9 30.2
21	21 15 45.52	− 6.310	−16 39 54.2	−27.14	1.283 1875	+2628.3	1.75	0.46	9 14.1
25	21 15 21.48	5.705	16 41 37.1	24.24	1.284 2771	2816.8	1.74	0.46	8 58.0
29	21 14 59.94	5.056	16 43 7.9	21.15	1.285 4389	2989.5	1.74	0.46	8 41.9
Oct. 3	21 14 41.08	4.369	16 44 26.1	17.92	1.286 6665	3145.9	1.73	0.45	8 25.9
7	21 14 25.03	3.653	16 45 31.1	14.60	1.287 9533	3284.4	1.73	0.45	8 9.9
11	21 14 11.89	− 2.914	−16 46 22.8	−11.22	1.289 2918	+3405.9	1.72	0.45	7 53.9
15	21 14 1.75	2.152	16 47 0.7	7.71	1.290 6758	3510.8	1.72	0.45	7 38.0
19	21 13 54.70	1.370	16 47 24.4	4.15	1.292 0982	3598.9	1.71	0.45	7 22.2
23	21 13 50.81	− 0.571	16 47 33.8	− 0.54	1.293 5526	3669.8	1.71	0.45	7 6.4
27	21 13 50.15	+ 0.241	16 47 28.6	+ 3.15	1.295 0313	3720.8	1.70	0.45	6 50.7
31	21 13 52.75	+ 1.061	−16 47 8.6	+ 6.84	1.296 5267	+3752.6	1.69	0.44	6 35.0
Nov. 4	21 13 58.64	1.880	16 46 33.9	10.51	1.298 0309	3765.5	1.69	0.44	6 19.4
8	21 14 7.78	2.688	16 45 44.6	14.13	1.299 5368	3761.0	1.68	0.44	6 3.8
12	21 14 20.14	3.491	16 44 40.9	17.73	1.301 0375	3739.9	1.68	0.44	5 48.3
16	21 14 35.70	4.287	16 43 22.8	21.30	1.302 5264	3702.0	1.67	0.44	5 32.8
20	21 14 54.42	+ 5.070	−16 41 50.6	+24.81	1.303 9969	+3647.9	1.66	0.44	5 17.4
24	21 15 16.24	5.837	16 40 4.4	28.28	1.305 4422	3575.8	1.66	0.44	5 2.0
28	21 15 41.09	6.583	16 38 4.5	31.63	1.306 8553	3486.9	1.65	0.43	4 46.7
Dec. 2	21 16 8.87	7.301	16 35 51.5	34.88	1.308 2297	3383.1	1.65	0.43	4 31.4
6	21 16 39.46	7.989	16 33 25.6	38.01	1.309 5598	3264.2	1.64	0.43	4 16.2
10	21 17 12.74	+ 8.645	−16 30 47.6	+40.99	1.310 8394	+3132.7	1.64	0.43	4 1.1
14	21 17 48.58	9.272	16 27 57.8	43.87	1.312 0644	2989.9	1.63	0.43	3 45.9
18	21 18 26.87	9.866	16 24 56.8	46.61	1.313 2296	2834.1	1.63	0.43	3 30.8
22	21 19 7.46	10.425	16 21 45.1	49.21	1.314 3301	2666.6	1.63	0.43	3 15.8
26	21 19 50.22	10.946	16 18 23.3	51.67	1.315 3613	2487.0	1.62	0.43	3 0.8
30	21 20 34.97	+11.421	−16 14 52.0	+53.93	1.316 3183	+2297.6	1.62	0.43	2 45.8
34	21 21 21.53	. . . .	−16 11 12.3	. . .	1.317 1981	. . . .	1.62	0.43	2 30.8

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var per Day.	Logarithm of Radius Vector.	Var. per Day.
		° ′ ″	″	″	° ′ ″	″		
Jan.	1	315 17 38.6	39.30	+7.8	−0 40 48.8	−0.25	1.299 4672	+21.6
	11	315 24 11.6	39.30	7.8	0 40 51.3	0.25	1.299 4888	21.5
	21	315 30 44.6	39.30	7.8	0 40 53.8	0.25	1.299 5102	21.4
	31	315 37 17.5	39.29	+7.8	−0 40 56.3	−0.25	1.299 5315	+21.3
Feb.	10	315 43 50.4	39.28	7.8	0 40 58.8	0.25	1.299 5528	21.2
	20	315 50 23.2	39.28	7.7	0 41 1.3	0.25	1.299 5740	21.2
Mar.	1	315 56 56.0	39.28	+7.7	−0 41 3.7	−0.25	1.299 5952	+21.1
	11	316 3 28.7	39.27	7.7	0 41 6.2	0.24	1.299 6162	21.0
	21	316 10 1.4	39.26	7.7	0 41 8.6	0.24	1.299 6372	20.9
	31	316 16 34.0	39.26	+7.6	−0 41 11.1	−0.24	1.299 6581	+20.9
Apr.	10	316 23 6.6	39.26	7.6	0 41 13.5	0.24	1.299 6789	20.8
	20	316 29 39.2	39.25	7.6	0 41 15.9	0.24	1.299 6997	20.8
	30	316 36 11.7	39.25	+7.6	−0 41 18.3	−0.24	1.299 7204	+20.7
May	10	316 42 44.1	39.24	7.6	0 41 20.7	0.24	1.299 7410	20.6
	20	316 49 16.5	39.24	7.5	0 41 23.1	0.24	1.299 7615	20.5
	30	316 55 48.9	39.24	+7.5	−0 41 25.5	−0.24	1.299 7819	+20.4
June	9	317 2 21.2	39.23	7.5	0 41 27.9	0.24	1.299 8023	20.3
	19	317 8 53.4	39.22	7.5	0 41 30.3	0.23	1.299 8226	20.2
	29	317 15 25.6	39.22	+7.5	−0 41 32.6	−0.23	1.299 8428	+20.2
July	9	317 21 57.8	39.21	7.4	0 41 34.9	0.23	1.299 8630	20.1
	19	317 28 29.9	39.21	7.4	0 41 37.2	0.23	1.299 8831	20.1
	29	317 35 2.0	39.20	+7.4	−0 41 39.6	−0.23	1.299 9031	+20.0
Aug.	8	317 41 34.0	39.20	7.4	0 41 41.9	0.23	1.299 9231	19.9
	18	317 48 6.0	39.19	7.4	0 41 44.2	0.23	1.299 9429	19.8
	28	317 54 37.9	39.19	+7.3	−0 41 46.5	−0.23	1.299 9627	+19.8
Sept.	7	318 1 9.8	39.19	7.3	0 41 48.8	0.23	1.299 9825	19.7
	17	318 7 41.7	39.18	7.3	0 41 51.0	0.23	1.300 0022	19.6
	27	318 14 13.5	39.18	+7.3	−0 41 53.3	−0.22	1.300 0217	+19.5
Oct.	7	318 20 45.2	39.17	7.2	0 41 55.5	0.22	1.300 0412	19.5
	17	318 27 16.9	39.17	7.2	0 41 57.8	0.22	1.300 0607	19.4
	27	318 33 48.6	39.16	+7.2	−0 42 0.0	−0.22	1.300 0801	+19.4
Nov.	6	318 40 20.2	39.16	7.2	0 42 2.3	0.22	1.300 0994	19.3
	16	318 46 51.7	39.15	7.1	0 42 4.5	0.22	1.300 1186	19.2
	26	318 53 23.2	39.15	+7.1	−0 42 6.7	−0.22	1.300 1378	+19.1
Dec.	6	318 59 54.7	39.14	7.1	0 42 8.9	0.22	1.300 1569	19.0
	16	319 6 26.1	39.14	7.1	0 42 11.1	0.22	1.300 1759	19.0
	26	319 12 57.5	39.13	+7.1	−0 42 13.2	−0.22	1.300 1949	+18.9
	36	319 19 28.8	39.13	+7.0	−0 42 15.4	−0.22	1.300 2137	+18.8

GREENWICH MEAN TIME.

Date.		Apparent Right Ascension.	Var. per Day.	Apparent Declination.	Var. per Day.	Logarithm of Distance from Earth.	Var. per Day.	Semi-diameter.	Hor. Parallax.
		Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*
		h m s	s	° ′ ″	″			″	″
Jan.	1	8 16 10.61	−6.357	+19 27 15.0	+21.00	1.463 8600	− 970.9	1.33	0.30
	5	8 15 44.73	6.577	19 28 40.4	21.69	1.463 5064	795.8	1.33	0.30
	9	8 15 18.05	6.753	19 30 8.3	22.24	1.463 2240	616.1	1.33	0.30
	13	8 14 50.77	6.880	19 31 38.1	22.63	1.463 0140	433.0	1.33	0.30
	17	8 14 23.07	6.963	19 33 9.1	22.86	1.462 8779	247.7	1.33	0.30
	21	8 13 55.12	−7.003	+19 34 40.8	+22.96	1.462 8159	− 62.1	1.33	0.30
	25	8 13 27.10	6.998	19 36 12.6	22.92	1.462 8282	+ 123.5	1.33	0.30
	29	8 12 59.19	6.949	19 37 44.0	22.73	1.462 9147	309.4	1.33	0.30
Feb.	2	8 12 31.57	6.853	19 39 14.3	22.41	1.463 0756	494.4	1.33	0.30
	6	8 12 4.43	6.709	19 40 43.1	21.95	1.463 3097	675.6	1.33	0.30
	10	8 11 37.95	−6.522	+19 42 9.7	+21.32	1.463 6154	+ 852.0	1.33	0.30
	14	8 11 12.31	6.290	19 43 33.5	20.57	1.463 9905	1022.2	1.33	0.30
	18	8 10 47.68	6.021	19 44 54.1	19.72	1.464 4323	1185.7	1.33	0.30
	22	8 10 24.19	5.716	19 46 11.1	18.76	1.464 9382	1342.9	1.33	0.30
	26	8 10 2.00	5.374	19 47 24.0	17.70	1.465 5056	1492.3	1.32	0.30
Mar.	1	8 9 41.24	−5.001	+19 48 32.5	+16.53	1.466 1309	+1633.4	1.32	0.30
	5	8 9 22.04	4.591	19 49 36.1	15.25	1.466 8111	1765.4	1.32	0.30
	9	8 9 4.55	4.150	19 50 34.4	13.89	1.467 5418	1886.7	1.32	0.30
	13	8 8 48.87	3.685	19 51 27.1	12.47	1.468 3189	1996.3	1.32	0.30
	17	8 8 35.09	3.201	19 52 14.1	10.99	1.469 1373	2094.7	1.31	0.30
	21	8 8 23.28	−2.703	+19 52 54.9	+ 9.46	1.469 9932	+2182.2	1.31	0.30
	25	8 8 13.49	2.194	19 53 29.7	7.88	1.470 8816	2259.0	1.31	0.30
	29	8 8 5.83	1.648	19 53 58.0	6.25	1.471 7989	2324.5	1.31	0.30
Apr.	2	8 8 0.32	1.101	19 54 19.7	4.60	1.472 7396	2377.9	1.30	0.30
	6	8 7 57.02	−0.549	19 54 34.8	2.92	1.473 6995	2418.7	1.30	0.30
	10	8 7 55.93	+0.006	+19 54 43.1	+ 1.22	1.474 6729	+2446.8	1.30	0.30
	14	8 7 57.07	0.564	19 54 44.6	− 0.46	1.475 6553	2462.5	1.29	0.29
	18	8 8 0.44	1.120	19 54 39.4	2.15	1.476 6414	2467.0	1.29	0.29
	22	8 8 6.02	1.667	19 54 27.4	3.84	1.477 6276	2462.1	1.29	0.29
	26	8 8 13.77	2.211	19 54 8.7	5.51	1.478 6096	2445.8	1.28	0.29
	30	8 8 23.70	+2.752	+19 53 43.3	− 7.18	1.479 5827	+2417.7	1.28	0.29
May	4	8 8 35.77	3.281	19 53 11.3	8.81	1.480 5423	2379.0	1.28	0.29
	8	8 8 49.93	3.795	19 52 32.8	10.42	1.481 4845	2329.5	1.28	0.29
	12	8 9 6.11	4.293	19 51 47.9	12.01	1.482 4045	2269.5	1.27	0.29
	16	8 9 24.25	4.773	19 50 56.8	13.52	1.483 2990	2201.5	1.27	0.29
	20	8 9 44.27	+5.233	+19 49 59.8	−15.00	1.484 1646	+2125.2	1.27	0.29
	24	8 10 6.09	5.675	19 48 56.9	16.43	1.484 9980	2040.5	1.27	0.29
	28	8 10 29.65	6.100	19 47 48.4	17.82	1.485 7959	1947.5	1.26	0.29
June	1	8 10 54.86	6.502	19 46 34.4	19.16	1.486 5549	1845.8	1.26	0.29
	5	8 11 21.63	6.876	19 45 15.2	20.42	1.487 2716	1737.2	1.26	0.29
	9	8 11 49.84	+7.226	+19 43 51.1	−21.61	1.487 9438	+1622.2	1.26	0.29
	13	8 12 19.40	7.546	19 42 22.4	22.72	1.488 5686	1501.2	1.26	0.29
	17	8 12 50.18	7.842	19 40 49.4	23.77	1.489 1441	1375.7	1.25	0.29
	21	8 13 22.10	8.113	19 39 12.3	24.75	1.489 6685	1245.6	1.25	0.29
	25	8 13 55.04	8.354	19 37 31.5	25.65	1.490 1399	1110.1	1.25	0.28
	29	8 14 28.89	+8.567	+19 35 47.2	−26.50	1.490 5560	+ 970.1	1.25	0.28
July	*3*	*8 15 3.54*	*+8.751*	+19 33 59.7	−27.23	1.490 9155	+ 826.4	1.25	0.28

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Day.	Apparent Declination.	Var. per Day.	Logarithm of Distance from Earth.	Var. per Day.	Semi-diameter.	Hor. Paral-lax.	Transit, Meridian of Greenwich.
	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″			″	″	h m
July 3	8 15 3.54	+8.751	+19 33 59.7	−27.23	1.490 9155	+ 826.4	1.25	0.28	1 30.1
7	8 15 38.86	8.903	19 32 9.5	27.86	1.491 2167	679.0	1.25	0.28	1 15.0
11	8 16 14.72	9.023	19 30 17.0	28.40	1.491 4585	530.2	1.25	0.28	0 59.8
15	8 16 51.00	9.113	19 28 22.5	28.83	1.491 6409	380.7	1.25	0.28	0 44.7
19	8 17 27.58	9.174	19 26 26.5	29.20	1.491 7629	229.6	1.25	0.28	0 29.6
23	8 18 4.35	+9.206	+19 24 29.1	−29.47	1.491 8244	+ 76.7	1.25	0.28	0 14.5
27	8 18 41.19	9.206	19 22 30.9	29.63	1.491 8241	− 77.6	1.25	0.28	23 55.6
31	8 19 17.96	9.174	19 20 32.2	29.71	1.491 7623	231.6	1.25	0.28	23 40.5
Aug. 4	8 19 54.54	9.110	19 18 33.4	29.63	1.491 6389	384.7	1.25	0.28	23 25.3
8	8 20 30.80	9.014	19 16 35.3	29.46	1.491 4547	536.4	1.25	0.28	23 10.2
12	8 21 6.61	+8.885	+19 14 37.9	−29.20	1.491 2101	− 685.6	1.25	0.28	22 55.1
16	8 21 41.85	8.733	19 12 41.9	28.83	1.490 9065	832.3	1.25	0.28	22 39.9
20	8 22 16.43	8.550	19 10 47.4	28.37	1.490 5446	977.1	1.25	0.28	22 24.8
24	8 22 50.21	8.335	19 8 55.1	27.78	1.490 1252	1119.2	1.25	0.28	22 9.6
28	8 23 23.07	8.089	19 7 5.3	27.07	1.489 6497	1257.9	1.25	0.29	21 54.4
ept. 1	8 23 54.89	+7.814	+19 5 18.7	−26.26	1.489 1195	−1391.8	1.25	0.29	21 39.2
5	8 24 25.54	7.509	19 3 35.4	25.34	1.488 5371	1519.6	1.26	0.29	21 24.0
9	8 24 54.93	7.179	19 1 56.1	24.30	1.487 9046	1641.8	1.26	0.29	21 8.7
13	8 25 22.94	6.825	19 0 21.1	23.19	1.487 2245	1757.6	1.26	0.29	20 53.5
17	8 25 49.50	6.446	18 58 50.7	21.99	1.486 4993	1867.6	1.26	0.29	20 38.2
21	8 26 14.48	+6.042	+18 57 25.3	−20.66	1.485 7313	−1970.7	1.26	0.29	20 22.8
25	8 26 37.80	5.614	18 56 5.5	19.25	1.484 9237	2066.6	1.27	0.29	20 7.5
29	8 26 59.36	5.163	18 54 51.4	17.75	1.484 0791	2154.0	1.27	0.29	19 52.1
ct. 3	8 27 19.07	4.688	18 53 43.6	16.13	1.483 2018	2231.0	1.27	0.29	19 36.7
7	8 27 36.84	4.197	18 52 42.4	14.47	1.482 2956	2298.6	1.27	0.29	19 21.3
11	8 27 52.63	+3.693	+18 51 47.9	−12.76	1.481 3642	−2356.9	1.28	0.29	19 5.8
15	8 28 6.37	3.176	18 51 0.4	10.97	1.480 4114	2405.1	1.28	0.29	18 50.3
19	8 28 18.02	2.643	18 50 20.2	9.12	1.479 4415	2443.3	1.28	0.29	18 34.8
23	8 28 27.50	2.096	18 49 47.5	7.22	1.478 4582	2471.0	1.28	0.29	18 19.2
27	8 28 34.78	1.542	18 49 22.5	5.28	1.477 4664	2486.0	1.29	0.29	18 3.6
31	8 28 39.83	+0.983	+18 49 5.3	− 3.31	1.476 4711	−2488.2	1.29	0.29	17 47.9
ov. 4	8 28 42.64	+0.421	18 48 56.0	− 1.32	1.475 4774	2478.5	1.29	0.29	17 32.2
8	8 28 43.20	−0.140	18 48 54.7	+ 0.64	1.474 4899	2457.0	1.30	0.30	17 16.5
12	8 28 41.53	0.696	18 49 1.1	2.60	1.473 5134	2423.2	1.30	0.30	17 0.8
16	8 28 37.64	1.247	18 49 15.5	4.57	1.472 5529	2377.8	1.30	0.30	16 45.0
20	8 28 31.56	−1.792	+18 49 37.6	+ 6.49	1.471 6128	−2320.1	1.31	0.30	16 29.1
24	8 28 23.31	2.331	18 50 7.3	8.39	1.470 6984	2249.7	1.31	0.30	16 13.3
28	8 28 12.94	2.852	18 50 44.6	10.24	1.469 8147	2166.1	1.31	0.30	15 57.4
ec. 2	8 28 0.53	3.350	18 51 29.1	12.00	1.468 9672	2069.9	1.31	0.30	15 41.4
6	8 27 46.17	3.826	18 52 20.4	13.66	1.468 1602	1963.3	1.32	0.30	15 25.4
10	8 27 29.95	−4.279	+18 53 18.2	+15.23	1.467 3978	−1846.2	1.32	0.30	15 9.4
14	8 27 11.97	4.706	18 54 22.1	16.72	1.466 6846	1718.8	1.32	0.30	14 53.4
18	8 26 52.34	5.105	18 55 31.8	18.12	1.466 0240	1582.1	1.32	0.30	14 37.3
22	8 26 31.17	5.474	18 56 46.9	19.38	1.465 4202	1435.0	1.32	0.30	14 21.3
26	8 26 8.60	5.804	18 58 6.7	20.51	1.464 8772	1278.7	1.33	0.30	14 5.2
30	8 25 44.79	−6.095	+18 59 30.8	+21.52	1.464 3982	−1115.1	1.33	0.30	13 49.0
34	8 25 19.89	. . .	+19 0 58.6	. . .	1.463 9859	. . .	1.33	0.30	13 32.9

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		° ′ ″	″	″	° ′ ″	″		
Jan.	1	121 8 52.6	21.73	−16.5	−0 17 59.3	+0.66	1.477 2821	+4.8
	11	121 12 29.9	21.73	16.5	0 17 52.7	0.66	1.477 2868	4.8
	21	121 16 7.2	21.73	16.4	0 17 46.1	0.66	1.477 2916	4.8
	31	121 19 44.5	21.73	−16.3	−0 17 39.5	+0.66	1.477 2963	+4.8
Feb.	10	121 23 21.8	21.73	16.2	0 17 32.8	0.66	1.477 3011	4.8
	20	121 26 59.1	21.73	16.0	0 17 26.2	0.66	1.477 3058	4.8
Mar.	1	121 30 36.4	21.73	−16.0	−0 17 19.5	+0.66	1.477 3106	+4.8
	11	121 34 13.7	21.73	15.9	0 17 12.9	0.66	1.477 3153	4.8
	21	121 37 51.1	21.73	15.8	0 17 6.2	0.66	1.477 3201	4.8
	31	121 41 28.4	21.73	−15.7	−0 16 59.6	+0.66	1.477 3248	+4.8
Apr.	10	121 45 5.7	21.73	15.5	0 16 53.0	0.66	1.477 3296	4.8
	20	121 48 43.0	21.73	15.4	0 16 46.4	0.66	1.477 3344	4.8
	30	121 52 20.4	21.73	−15.4	−0 16 39.7	+0.66	1.477 3392	+4.8
May	10	121 55 57.7	21.73	15.3	0 16 33.1	0.66	1.477 3440	4.8
	20	121 59 35.1	21.73	15.2	0 16 26.4	0.66	1.477 3488	4.8
	30	122 3 12.4	21.73	−15.0	−0 16 19.8	+0.66	1.477 3536	+4.8
June	9	122 6 49.8	21.73	14.9	0 16 13.1	0.66	1.477 3584	4.8
	19	122 10 27.1	21.73	14.9	0 16 6.5	0.66	1.477 3632	4.8
	29	122 14 4.5	21.73	−14.8	−0 15 59.8	+0.66	1.477 3681	+4.8
July	9	122 17 41.8	21.73	14.6	0 15 53.2	0.66	1.477 3729	4.8
	19	122 21 19.2	21.74	14.5	0 15 46.5	0.66	1.477 3777	4.8
	29	122 24 56.5	21.74	−14.5	−0 15 39.9	+0.66	1.477 3825	+4.8
Aug.	8	122 28 33.9	21.74	14.4	0 15 33.2	0.66	1.477 3873	4.8
	18	122 32 11.3	21.74	14.3	0 15 26.6	0.66	1.477 3921	4.8
	28	122 35 48.7	21.74	−14.2	−0 15 19.9	+0.66	1.477 3970	+4.8
Sept.	7	122 39 26.0	21.74	14.0	0 15 13.3	0.66	1.477 4018	4.8
	17	122 43 3.4	21.74	13.9	0 15 6.6	0.66	1.477 4066	4.8
	27	122 46 40.8	21.74	−13.9	−0 15 0.0	+0.66	1.477 4114	+4.8
Oct.	7	122 50 18.2	21.74	13.8	0 14 53.3	0.66	1.477 4163	4.8
	17	122 53 55.5	21.74	13.6	0 14 46.7	0.66	1.477 4211	4.8
	27	122 57 32.9	21.74	−13.5	−0 14 40.0	+0.66	1.477 4259	+4.8
Nov.	6	123 1 10.3	21.74	13.5	0 14 33.4	0.66	1.477 4307	4.8
	16	123 4 47.7	21.74	13.4	0 14 26.7	0.67	1.477 4356	4.8
	26	123 8 25.1	21.74	−13.3	−0 14 20.1	+0.67	1.477 4404	+4.8
Dec.	6	123 12 2.5	21.74	13.1	0 14 13.4	0.67	1.477 4453	4.8
	16	123 15 39.9	21.74	13.0	0 14 6.7	0.67	1.477 4501	4.8
	26	123 19 17.3	21.74	−12.9	−0 14 0.0	+0.67	1.477 4550	+4.8
	36	123 22 54.7	21.74	−12.8	−0 13 53.4	+0.67	1.477 4598	+4.8

PART II.

ASTRONOMICAL EPHEMERIS FOR THE MERIDIAN OF WASHINGTON.

The constants of precession, nutation and aberration adopted by the *Conférence Internationale des Étoiles Fondamentales* which met in Paris in May, 1896, are given on page xviii, and together with the notation of **Bessel** are used in the formulæ which follow.

BESSELIAN STAR-NUMBERS.

Terms of Long Period.	*Terms of Short Period.*
$A=\tau-\ 0.342\,20 \sin \text{☊}$	$-0.004\,05 \sin 2\,\text{☾}$
$+\ 0.004\,15 \sin 2\,\text{☊}$	$+0.000\,23 \sin (\text{☾}+\Gamma')$
$-\ 0.025\,26 \sin 2\,\mathrm{L}$	$+0.001\,34 \sin (\text{☾}-\Gamma')$
$+\ 0.002\,51 \sin (\mathrm{L}-\Gamma)$	$-0.000\,68 \sin (2\,\text{☾}-\text{☊})$
$-\ 0.000\,99 \sin (3\,\mathrm{L}-\Gamma)$	$-0.000\,52 \sin (3\,\text{☾}-\Gamma')$
$+\ 0.000\,42 \sin (\mathrm{L}+\Gamma)$	$+0.000\,30 \sin (\text{☾}-2\,\mathrm{L}+\Gamma')$
$+\ 0.000\,25 \sin (2\,\mathrm{L}-\text{☊})$	$+0.000\,12 \sin 2\,(\text{☾}-\mathrm{L})$
$''$	$''$
$B=\ -\ 9.210 \cos \text{☊}$	$-0.088 \cos 2\,\text{☾}$
$+\ 0.090 \cos 2\,\text{☊}$	$-0.018 \cos (2\,\text{☾}-\text{☊})$
$-\ 0.552 \cos 2\,\mathrm{L}$	$-0.011 \cos (3\,\text{☾}-\Gamma')$
$-\ 0.022 \cos (3\,\mathrm{L}-\Gamma)$	$+0.005 \cos (\text{☾}+\Gamma')$
$+\ 0.009 \cos (\mathrm{L}+\Gamma)$	
$+\ 0.007 \cos (2\,\mathrm{L}-\text{☊})$	

$$C=\ -20.4700 \cos \omega \cos \odot$$

$$D=\ -20.4700 \sin \odot$$

$$E=\ -\ 0.0417 \sin \text{☊}+0''.0005 \sin 2\,\text{☊}-0''.0031 \sin 2\,\mathrm{L}$$

Bessel's *Star-Constants.*

$a=3^{s}.072\,63+1^{s}.336\,37 \sin \alpha_0 \tan \delta_0$	$a'=20''.0455 \cos \alpha_0$
$b=\frac{1}{15} \cos \alpha_0 \tan \delta_0$	$b'=-\sin \alpha_0$
$c=\frac{1}{15} \cos \alpha_0 \sec \delta_0$	$c'=\tan \omega \cos \delta_0-\sin \alpha_0 \sin \delta_0$
$d=\frac{1}{15} \sin \alpha_0 \sec \delta_0$	$d'=\cos \alpha_0 \sin \delta_0$

Formulæ for Reduction to Apparent Position.

$$\alpha=\alpha_0+\tau\mu+Aa+Bb+Cc+Dd+\tfrac{1}{15}E \qquad \text{(in time)}$$
$$\delta=\delta_0+\tau\mu'+Aa'+Bb'+Cc'+Dd' \qquad \text{(in arc)}$$

INDEPENDENT STAR-NUMBERS.

$$f+f'=+\ 46''.0895\ A+E \qquad \text{(in arc)}$$
$$=+\ 3^{s}.07263\ A+\tfrac{1}{15}E \qquad \text{(in time)}$$
$$f'=-\ 0^{s}.0124 \sin 2\,\text{☾}+0^{s}.0041 \sin (\text{☾}-\Gamma')+0^{s}.0007 \sin (\text{☾}+\Gamma')$$
$$-\ 0^{s}.0021 \sin (2\,\text{☾}-\text{☊})-0^{s}.0016 \sin (3\,\text{☾}-\Gamma')$$
$$+\ 0^{s}.0009 \sin (\text{☾}-2\,\mathrm{L}+\Gamma')+0^{s}.0004 \sin 2\,(\text{☾}-\mathrm{L})$$

$g \sin G=B$ $\qquad$ $h \sin H=C$ $\qquad$ $i=C \tan \omega$

$g \cos G=20''.0455\ A$ $\qquad$ $h \cos H=D$

Formulæ for Reduction to Apparent Position.

$$\alpha=\alpha_0+f+f'+\tau\mu+\tfrac{1}{15}\,g \sin (G+\alpha_0) \tan \delta_0+\tfrac{1}{15}\,h \sin (H+\alpha_0) \sec \delta_0 \qquad \text{(in time)}$$
$$\delta=\delta_0+\tau\mu'+g \cos (G+\alpha_0)+h \cos (H+\alpha_0) \sin \delta_0+i \cos \delta_0 \qquad \text{(in arc)}$$

In the above formulæ,

τ denotes the time reckoned in units of one year, from the beginning of the Besselian fictitious year (1916, January $0^{d}.975$, Washington mean time),

α_0, δ_0, the star's mean R. A. and Decl. at the beginning of the fictitious year,

α, δ, the star's apparent right ascension and declination at the time τ,

μ, μ', the annual proper motion in right ascension and declination,

$\odot$, the Sun's true longitude,
L, the Sun's mean longitude,
☊, the longitude of the Moon's ascending node,

ω, the obliquity of the ecliptic,
Γ, the long. of the Sun's perigee,
Γ', the long. of the Moon's perigee,
☾, the Moon's mean longitude.

The independent star-numbers are more convenient than Bessel's, when only one or two apparent positions of a star are required, or when Bessel's star-constants are not known with sufficient accuracy.

In using the star-constants of the *British Association Catalogue*, a, b, c, d, a', b', c', d', with the star-numbers of this Ephemeris, the quantities to be computed are Ac, Bd, Ca, Db, $-Ac'$, $-Bd'$, $-Ca'$, $-Db'$.

In the computation of the Besselian star-numbers given for Washington mean midnight of each day of the year, on pages 202–205, the short-period terms—that is, the terms involving the Moon's mean longitude—have been included.

In the computation of the independent star-numbers, pages 206–213, the short-period terms have been included in the two columns headed G and Log g. The quantities f and f' give separately the effect of the long-period and short-period terms. f' differs but slightly from the quantity $-0''.1866 \sin 2\,☾ + 0''.0622 \sin (☾ - \Gamma')$ given on page 37 of the *Procès-Verbaux* of the Paris Conference of 1896, which quantity that conference decided should be omitted in the reduction of stars from mean to apparent place.

In computing the ephemerides of the circumpolar stars in this volume, all short-period terms have been included. The quantity f', which was omitted from the ephemerides of the circumpolar stars given in the *American Ephemeris and Nautical Almanac* for the years 1900 to 1915, inclusive, is now included in these ephemerides in accordance with the decision of the *Congrès International des Éphémérides Astronomiques* held at Paris in October, 1911. See page 43 of *Procès-Verbaux* of that Congress.

In the computation of the ephemerides of the ten-day stars, no short-period terms have been included. These terms attain two maxima and two minima during the tropical month. At maximum and minimum they may amount in right ascension to $\pm 0^{s}.008 \tan \delta$, and in declination to $\pm 0''.13$. For computing the effect of these terms for the correction of the positions of stars interpolated from the ten-day ephemerides, the following formulæ may be used, in which $\Delta\alpha$ and $\Delta\delta$ denote the effect of the short-period terms in right ascension and declination, respectively, and $\delta''\psi$ and $\delta''\omega$, the sum of the short-period terms of the nutation in longitude and obliquity:

$$\Delta\alpha = D_{\psi}\alpha\ \delta''\psi + D_{\omega}\alpha\ \delta''\omega$$
$$\Delta\delta = D_{\psi}\delta\ \delta''\psi + D_{\omega}\delta\ \delta''\omega$$

The values of $\delta''\psi$ and of $\delta''\omega$ for Washington mean midnight are given for each day of the year on pages 215–216, and have been computed as follows:

$$\delta''\psi = 50''.37\, A_2 \qquad\qquad \delta''\omega = -B_2$$

in which A_2 and B_2 are the sums of the short-period terms given in the expressions for A and B on page 200.

The quantities $D_{\psi}\alpha$, $D_{\omega}\alpha$, $D_{\psi}\delta$, and $D_{\omega}\delta$ are given for each ten-day star on pages 316–513, and have been computed by means of the following formulæ:

$$D_{\psi}\alpha = \tfrac{1}{15}(\cos\omega + \sin\alpha \tan\delta \sin\omega) \qquad D_{\omega}\alpha = -\tfrac{1}{15}\cos\alpha \tan\delta$$
$$D_{\psi}\delta = \cos\alpha \sin\omega \qquad D_{\omega}\delta = \sin\alpha$$

In the *Star List of the American Ephemeris* for the years 1910 and 1911 and in the *American Ephemeris and Nautical Almanac* for the years 1912 to 1915, inclusive, the value used for the derivative of the right ascension with reference to ψ was

$$D'_{\psi}\alpha = \tfrac{1}{15}\sin\alpha \tan\delta \sin\omega$$

and the addition of the term $\frac{1}{15}\cos\omega$ is made in accordance with the above-mentioned decision of the *Congrès International des Éphémérides Astronomiques* of 1911 with reference to the quantity f'.

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hr.)		Log *A*.	Log *B*.	Log *C*.	Log *D*.	Solar Day. (Sid. Hr.)		Log *A*.	Log *B*.	Log *C*.	Log *D*.
Jan.	0	+9.41507	−0.7284	−0.48985	+1.30516	Feb.	15	+9.62468	−0.7601	−1.19336	+1.05624
	1	9.42344	0.7247	0.53382	1.30380		16	9.62787	0.7637	1.19838	1.04458
	2	9.43318	0.7222	0.57362	1.30230		17	9.63034	0.7676	1.20321	1.03247
	3	9.44352	0.7217	0.60995	1.30065		18	9.63202	0.7711	1.20785	1.01968
	4	9.45345	0.7233	0.64335	1.29886	h	19	9.63297	0.7738	1.21230	1.00678
h	5	+9.46216	−0.7267	−0.67423	+1.29693	(10.0)	20	+9.63348	−0.7753	−1.21658	+0.99314
(7.0)	6	9.46916	0.7311	0.70294	1.29485		21	9.63391	0.7752	1.22068	0.97893
	7	9.47426	0.7354	0.72973	1.29262		22	9.63477	0.7736	1.22460	0.96410
	8	9.47776	0.7387	0.75483	1.29024		23	9.63641	0.7710	1.22836	0.94861
	9	9.48028	0.7404	0.77842	1.28771		24	9.63911	0.7680	1.23195	0.93242
	10	+9.48256	−0.7403	−0.80067	+1.28502		25	+9.64282	−0.7654	−1.23538	+0.91547
	11	9.48522	0.7387	0.82170	1.28218		26	9.64733	0.7642	1.23865	0.89770
	12	9.48875	0.7362	0.84162	1.27919		27	9.65206	0.7648	1.24176	0.87904
	13	9.49331	0.7333	0.86054	1.27604		28	9.65653	0.7672	1.24471	0.85941
	14	9.49885	0.7307	0.87853	1.27272		29	9.66018	0.7709	1.24751	0.83872
	15	+9.50509	−0.7291	−0.89566	+1.26924	Mar.	1	+9.66275	−0.7751	−1.25015	+0.81686
	16	9.51171	0.7287	0.91202	1.26560		2	9.66424	0.7788	1.25265	0.79372
	17	9.51833	0.7296	0.92764	1.26179		3	9.66486	0.7813	1.25500	0.76915
	18	9.52461	0.7318	0.94259	1.25781		4	9.66503	0.7822	1.25720	0.74297
	19	9.53026	0.7351	0.95690	1.25365	h	5	9.66525	0.7814	1.25926	0.71498
h	20	+9.53504	−0.7390	−0.97063	+1.24932	(11.0)	6	+9.66587	−0.7793	−1.26118	+0.68495
(8.0)	21	9.53881	0.7430	0.98379	1.24480		7	9.66718	0.7764	1.26296	0.65256
	22	9.54157	0.7466	0.99644	1.24010		8	9.66923	0.7733	1.26459	0.61743
	23	9.54353	0.7493	1.00859	1.23521		9	9.67187	0.7708	1.26609	0.57909
	24	9.54507	0.7504	1.02028	1.23013		10	9.67496	0.7691	1.26745	0.53692
	25	+9.54669	−0.7500	−1.03152	+1.22485		11	+9.67823	−0.7685	−1.26867	+0.49009
	26	9.54900	0.7480	1.04235	1.21937		12	9.68140	0.7691	1.26976	0.43748
	27	9.55247	0.7452	1.05278	1.21368		13	9.68431	0.7707	1.27071	0.37750
	28	9.55725	0.7424	1.06282	1.20777		14	9.68676	0.7730	1.27153	0.30777
	29	9.56318	0.7405	1.07251	1.20165		15	9.68864	0.7757	1.27222	0.22457
	30	+9.56984	−0.7403	−1.08185	+1.19530		16	+9.68989	−0.7782	−1.27277	+0.12146
	31	9.57655	0.7420	1.09086	1.18872		17	9.69052	0.7801	1.27319	9.98590
Feb.	1	9.58263	0.7456	1.09955	1.18190		18	9.69071	0.7809	1.27348	9.78771
	2	9.58751	0.7503	1.10793	1.17484		19	9.69078	0.7802	1.27364	+9.41272
	3	9.59102	0.7552	1.11601	1.16753		20	9.69108	0.7779	1.27368	−8.98189
h	4	+9.59327	−0.7594	−1.12382	+1.15995	h	21	+9.69197	−0.7744	−1.27358	−9.65348
(9.0)	5	9.59460	0.7622	1.13134	1.15210	(12.0)	22	9.69375	0.7703	1.27334	9.90542
	6	9.59553	0.7632	1.13861	1.14397		23	9.69648	0.7663	1.27298	0.06368
	7	9.59667	0.7627	1.14562	1.13556		24	9.70002	0.7634	1.27249	0.17927
	8	9.59838	0.7609	1.15238	1.12684		25	9.70396	0.7621	1.27187	0.27032
	9	+9.60083	−0.7586	−1.15890	+1.11781		26	+9.70779	−0.7626	−1.27112	−0.34542
	10	9.60408	0.7564	1.16519	1.10845		27	9.71107	0.7647	1.27024	0.40928
	11	9.60799	0.7549	1.17125	1.09875		28	9.71347	0.7676	1.26923	0.46480
	12	9.61229	0.7544	1.17709	1.08870		29	9.71488	0.7703	1.26808	0.51389
	13	9.61670	0.7552	1.18272	1.07827		30	9.71548	0.7720	1.26681	0.55785
	14	+9.62090	−0.7571	−1.18814	+1.06746		31	+9.71559	−0.7722	−1.26540	−0.59762
	15	+9.62468	−0.7601	−1.19336	+1.05624	Apr.	1	+9.71562	−0.7706	−1.26386	−0.63392

$E = +0''.03 = +0^s.002$

FOR WASHINGTON MEAN MIDNIGHT.

olar Day. Sid. Hr.)	Log *A*.	Log *B*.	Log *C*.	Log *D*.	Solar Day. (Sid. Hr.)	Log *A*.	Log *B*.	Log *C*.	Log *D*.
pr. 1	+9.71562	−0.7706	−1.26386	−0.63392	May 17	+9.80422	−0.6711	−1.01070	−1.23432
2	9.71598	0.7675	1.26218	0.66729	18	9.80801	0.6667	0.99930	1.23899
3	9.71694	0.7634	1.26037	0.69813	19	9.81196	0.6646	0.98746	1.24348
4	9.71857	0.7588	1.25843	0.72679	20	9.81573	0.6649	0.97517	1.24780
5	9.72086	0.7546	1.25635	0.75354	21	9.81894	0.6668	0.96241	1.25196
13$^{\mathrm{h}}$.0) 6	+9.72360	−0.7512	−1.25413	−0.77860	(16$^{\mathrm{h}}$.0) 22	+9.82138	−0.6695	−0.94913	−1.25595
7	9.72661	0.7489	1.25178	0.80215	23	9.82307	0.6717	0.93531	1.25979
8	9.72960	0.7479	1.24928	0.82436	24	9.82416	0.6725	0.92092	1.26347
9	9.73240	0.7480	1.24664	0.84536	25	9.82494	0.6713	0.90591	1.26700
10	9.73485	0.7490	1.24386	0.86525	26	9.82581	0.6679	0.89024	1.27038
11	+9.73680	−0.7504	−1.24094	−0.88414	27	+9.82699	−0.6628	−0.87386	−1.27361
12	9.73824	0.7519	1.23787	0.90210	28	9.82871	0.6568	0.85672	1.27670
13	9.73917	0.7528	1.23465	0.91922	29	9.83100	0.6507	0.83875	1.27964
14	9.73971	0.7529	1.23128	0.93555	30	9.83373	0.6453	0.81989	1.28244
15	9.74002	0.7514	1.22776	0.95118	31	9.83678	0.6414	0.80005	1.28510
16	+9.74046	−0.7484	−1.22409	−0.96612	June 1	+9.83994	−0.6390	−0.77914	−1.28762
17	9.74140	0.7438	1.22026	0.98043	2	9.84302	0.6383	0.75704	1.29001
18	9.74306	0.7384	1.21627	0.99416	3	9.84586	0.6391	0.73364	1.29226
19	9.74559	0.7328	1.21212	1.00734	4	9.84838	0.6409	0.70880	1.29438
20	9.74890	0.7280	1.20780	1.02000	5	9.85047	0.6431	0.68231	1.29637
14$^{\mathrm{h}}$.0) 21	+9.75271	−0.7248	−1.20332	−1.03217	(17$^{\mathrm{h}}$.0) 6	+9.85215	−0.6452	−0.65399	−1.29823
22	9.75656	0.7236	1.19866	1.04389	7	9.85345	0.6464	0.62358	1.29996
23	9.76007	0.7243	1.19383	1.05517	8	9.85449	0.6463	0.59075	1.30156
24	9.76286	0.7262	1.18882	1.06604	9	9.85546	0.6444	0.55512	1.30303
25	9.76477	0.7284	1.18363	1.07651	10	9.85663	0.6406	0.51618	1.30438
26	+9.76588	−0.7298	−1.17825	−1.08661	11	+9.85825	−0.6353	−0.47328	−1.30560
27	9.76646	0.7297	1.17268	1.09636	12	9.86048	0.6292	0.42555	1.30670
28	9.76684	0.7277	1.16691	1.10576	13	9.86336	0.6235	0.37180	1.30768
29	9.76744	0.7239	1.16094	1.11484	14	9.86678	0.6192	0.31033	1.30853
30	9.76851	0.7187	1.15476	1.12361	15	9.87050	0.6172	0.23857	1.30926
ay 1	+9.77018	−0.7130	−1.14838	−1.13208	16	+9.87415	−0.6179	−0.15242	−1.30987
2	9.77251	0.7073	1.14177	1.14026	17	9.87741	0.6209	0.04470	1.31036
3	9.77531	0.7024	1.13494	1.14816	18	9.88005	0.6252	9.90099	1.31073
4	9.77840	0.6988	1.12787	1.15579	19	9.88196	0.6293	9.68454	1.31098
5	9.78156	0.6966	1.12057	1.16317	20	9.88331	0.6322	−9.23315	1.31110
15$^{\mathrm{h}}$.0) 6	+9.78458	−0.6958	−1.11302	−1.17030	(18$^{\mathrm{h}}$.0) 21	+9.88427	−0.6330	+9.15095	−1.31111
7	9.78732	0.6960	1.10521	1.17719	22	9.88513	0.6315	9.65721	1.31099
8	9.78963	0.6970	1.09714	1.18384	23	9.88621	0.6280	9.88458	1.31076
9	9.79149	0.6982	1.08879	1.19027	24	9.88767	0.6232	0.03296	1.31040
10	9.79290	0.6991	1.08016	1.19648	25	9.88964	0.6180	0.14326	1.30992
11	+9.79393	−0.6991	−1.07124	−1.20248	26	+9.89202	−0.6134	+0.23105	−1.30933
12	9.79472	0.6977	1.06200	1.20827	27	9.89469	0.6102	0.30393	1.30861
13	9.79555	0.6945	1.05245	1.21386	28	9.89754	0.6088	0.36622	1.30777
14	9.79670	0.6897	1.04256	1.21926	29	9.90032	0.6093	0.42058	1.30680
15	9.79848	0.6836	1.03231	1.22446	30	9.90293	0.6114	0.46877	1.30572
16	+9.80098	−0.6770	−1.02170	−1.22948	July 1	+9.90530	−0.6146	+0.51204	−1.30451
17	+9.80422	−0.6711	−1.01070	−1.23432	2	+9.90724	−0.6185	+0.55127	−1.30318

$E = +0''.03 = +0^{s}.002$

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hr.)	Log *A*.	Log *B*.	Log *C*.	Log *D*.	Solar Day. (Sid. Hr.)	Log *A*.	Log *B*.	Log *C*.	Log *D*.
July 1	+9.90530	−0.6146	+0.51204	−1.30451	Aug. 16	+9.97610	−0.6599	+1.18134	−1.08090
2	9.90724	0.6185	0.55127	1.30318	17	9.97665	0.6576	1.18656	1.07070
3	9.90881	0.6224	0.58714	1.30172	18	9.97754	0.6542	1.19159	1.06013
4	9.91003	0.6256	0.62016	1.30014	19	9.97880	0.6509	1.19645	1.04917
5	9.91097	0.6276	0.65073	1.29843	20	9.98038	0.6484	1.20113	1.03779
(19^{h}.0) 6	+9.91180	−0.6278	+0.67917	−1.29659	(22^{h}.0) 21	+9.98214	−0.6473	+1.20565	−1.02597
7	9.91268	0.6260	0.70575	1.29462	22	9.98394	0.6479	1.21000	1.01369
8	9.91387	0.6226	0.73069	1.29253	23	9.98565	0.6500	1.21418	1.00092
9	9.91554	0.6182	0.75415	1.29030	24	9.98717	0.6534	1.21821	0.98763
10	9.91775	0.6136	0.77630	1.28795	25	9.98843	0.6575	1.22208	0.97379
11	+9.92052	−0.6103	+0.79726	−1.28546	26	+9.98938	−0.6619	+1.22579	−0.95935
12	9.92362	0.6090	0.81713	1.28283	27	9.99000	0.6659	1.22935	0.94428
13	9.92677	0.6105	0.83603	1.28006	28	9.99038	0.6690	1.23277	0.92854
14	9.92969	0.6144	0.85402	1.27716	29	9.99056	0.6706	1.23603	0.91207
15	9.93212	0.6199	0.87118	1.27412	30	9.99069	0.6706	1.23915	0.89481
16	+9.93395	−0.6258	+0.88758	−1.27093	31	+9.99093	−0.6688	+1.24212	−0.87670
17	9.93518	0.6307	0.90326	1.26760	Sept. 1	9.99144	0.6657	1.24496	0.85767
18	9.93602	0.6337	0.91829	1.26412	2	9.99238	0.6618	1.24765	0.83762
19	9.93666	0.6343	0.93270	1.26048	3	9.99378	0.6581	1.25020	0.81646
20	9.93741	0.6328	0.94653	1.25670	4	9.99554	0.6557	1.25261	0.79408
(20^{h}.0) 21	+9.93843	−0.6297	+0.95982	−1.25276	(23^{h}.0) 5	+9.99756	−0.6553	+1.25489	−0.77034
22	9.93985	0.6259	0.97261	1.24866	6	9.99952	0.6572	1.25704	0.74509
23	9.94168	0.6224	0.98491	1.24440	7	0.00124	0.6610	1.25905	0.71813
24	9.94382	0.6201	0.99676	1.23998	8	0.00254	0.6658	1.26092	0.68924
25	9.94610	0.6195	1.00819	1.23538	9	0.00334	0.6705	1.26267	0.65815
26	+9.94839	−0.6206	+1.01920	−1.23061	10	+0.00370	−0.6739	+1.26429	−0.62450
27	9.95055	0.6234	1.02983	1.22567	11	0.00380	0.6753	1.26577	0.58786
28	9.95246	0.6275	1.04008	1.22055	12	0.00384	0.6744	1.26713	0.54769
29	9.95407	0.6322	1.04999	1.21524	13	0.00404	0.6716	1.26835	0.50326
30	9.95535	0.6371	1.05955	1.20974	14	0.00457	0.6675	1.26945	0.45359
31	+9.95628	−0.6414	+1.06880	−1.20405	15	+0.00546	−0.6630	+1.27043	−0.39731
Aug. 1	9.95694	0.6447	1.07773	1.19815	16	0.00668	0.6591	1.27127	0.33245
2	9.95740	0.6463	1.08637	1.19206	17	0.00812	0.6563	1.27199	0.25597
3	9.95787	0.6461	1.09472	1.18575	18	0.00966	0.6551	1.27258	0.16287
4	9.95853	0.6442	1.10280	1.17922	19	0.01114	0.6555	1.27304	0.04394
5	+9.95956	−0.6410	+1.11061	−1.17247	(0^{h}.0) 20	+0.01247	−0.6572	+1.27338	−9.87931
(21^{h}.0) 6	9.96105	0.6374	1.11817	1.16548	21	0.01355	0.6598	1.27359	9.61050
7	9.96304	0.6345	1.12548	1.15826	22	0.01438	0.6627	1.27368	−8.76340
8	9.96542	0.6333	1.13255	1.15079	23	0.01493	0.6654	1.27364	+9.46553
9	9.96793	0.6345	1.13939	1.14306	24	0.01522	0.6674	1.27347	9.80775
10	+9.97034	−0.6380	+1.14601	−1.13507	25	+0.01533	−0.6682	+1.27317	+9.99676
11	9.97239	0.6434	1.15240	1.12680	26	0.01536	0.6672	1.27274	0.12800
12	9.97390	0.6494	1.15859	1.11825	27	0.01545	0.6645	1.27219	0.22858
13	9.97490	0.6548	1.16457	1.10939	28	0.01577	0.6602	1.27151	0.31013
14	9.97545	0.6587	1.17036	1.10022	29	0.01645	0.6549	1.27070	0.37869
15	+9.97577	−0.6604	+1.17594	−1.09073	30	+0.01754	−0.6494	+1.26975	+0.43780
16	+9.97610	−0.6599	+1.18134	−1.08090	Oct. 1	+0.01906	−0.6448	+1.26868	+0.48974

$E = +0''.04 = +0^{s}.003$

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hr.)	Log *A*.	Log *B*.	Log *C*.	Log *D*.	Solar Day. (Sid. Hr.)	Log *A*.	Log *B*.	Log *C*.	Log *D*.
Oct. 1	+0.01906	−0.6448	+1.26868	+0.48974	Nov. 16	+0.06732	−0.5398	+1.03719	+1.22203
2	0.02083	0.6420	1.26748	0.53603	17	0.06813	0.5406	1.02625	1.22738
3	0.02267	0.6415	1.26614	0.57776	18	0.06876	0.5404	1.01488	1.23253
h 4	0.02436	0.6432	1.26466	0.61573	h 19	0.06927	0.5384	1.00306	1.23749
(1.0) 5	0.02570	0.6463	1.26306	0.65054	(4.0) 20	0.06979	0.5343	0.99076	1.24226
6	+0.02657	−0.6497	+1.26132	+0.68266	21	+0.07042	−0.5279	+0.97793	+1.24685
7	0.02702	0.6521	1.25944	0.71247	22	0.07131	0.5198	0.96463	1.25126
8	0.02718	0.6526	1.25742	0.74025	23	0.07257	0.5106	0.95074	1.25549
9	0.02721	0.6509	1.25526	0.76625	24	0.07422	0.5017	0.93623	1.25955
10	0.02734	0.6468	1.25296	0.79068	25	0.07616	0.4946	0.92108	1.26343
11	+0.02778	−0.6411	+1.25051	+0.81369	26	+0.07832	−0.4903	+0.90524	+1.26715
12	0.02855	0.6347	1.24792	0.83544	27	0.08046	0.4894	0.88865	1.27071
13	0.02969	0.6284	1.24518	0.85604	28	0.08238	0.4915	0.87125	1.27410
14	0.03111	0.6232	1.24230	0.87559	29	0.08395	0.4952	0.85298	1.27734
15	0.03265	0.6197	1.23926	0.89418	30	0.08511	0.4989	0.83376	1.28041
16	+0.03421	−0.6179	+1.23606	+0.91190	Dec. 1	+0.08590	−0.5010	+0.81350	+1.28333
17	0.03563	0.6177	1.23271	0.92881	2	0.08646	0.5003	0.79210	1.28609
18	0.03685	0.6186	1.22920	0.94497	3	0.08699	0.4963	0.76945	1.28870
19	0.03783	0.6201	1.22552	0.96044	h 4	0.08768	0.4894	0.74540	1.29117
h 20	0.03856	0.6216	1.22168	0.97525	(5.0) 5	0.08863	0.4806	0.71979	1.29348
(2.0) 21	+0.03906	−0.6224	+1.21767	+0.98946	6	+0.08996	−0.4713	+0.69242	+1.29564
22	0.03935	0.6220	1.21349	1.00310	7	0.09155	0.4630	0.66306	1.29766
23	0.03957	0.6200	1.20913	1.01620	8	0.09333	0.4567	0.63141	1.29954
24	0.03981	0.6161	1.20460	1.02880	9	0.09520	0.4532	0.59712	1.30127
25	0.04025	0.6103	1.19988	1.04092	10	0.09702	0.4525	0.55973	1.30286
26	+0.04098	−0.6031	+1.19497	+1.05260	11	+0.09870	−0.4540	+0.51866	+1.30430
27	0.04212	0.5954	1.18987	1.06384	12	0.10017	0.4570	0.47312	1.30561
28	0.04367	0.5883	1.18457	1.07468	13	0.10139	0.4605	0.42208	1.30677
29	0.04552	0.5829	1.17906	1.08513	14	0.10240	0.4638	0.36406	1.30780
30	0.04751	0.5800	1.17336	1.09521	15	0.10322	0.4659	0.29690	1.30869
31	+0.04940	−0.5797	+1.16744	+1.10493	16	+0.10388	−0.4663	+0.21722	+1.30944
Nov. 1	0.05101	0.5815	1.16130	1.11432	17	0.10451	0.4643	0.11938	1.31005
2	0.05222	0.5842	1.15493	1.12338	18	0.10520	0.4599	9.99266	1.31052
3	0.05299	0.5863	1.14834	1.13213	19	0.10608	0.4532	9.81273	1.31086
h 4	0.05344	0.5866	1.14150	1.14058	h 20	0.10726	0.4452	+9.49960	1.31106
(3.0) 5	+0.05372	−0.5844	+1.13441	+1.14874	(6.0) 21	+0.10879	−0.4371	−8.25547	+1.31112
6	0.05406	0.5795	1.12707	1.15662	22	0.11063	0.4306	9.54657	1.31104
7	0.05461	0.5723	1.11947	1.16424	23	0.11272	0.4271	9.83630	1.31083
8	0.05551	0.5638	1.11159	1.17160	24	0.11483	0.4275	0.00848	1.31048
9	0.05676	0.5552	1.10342	1.17870	25	0.11681	0.4315	0.13135	1.30999
10	+0.05830	−0.5477	+1.09495	+1.18556	26	+0.11851	−0.4380	−0.22691	+1.30936
11	0.06002	0.5420	1.08618	1.19219	27	0.11982	0.4453	0.30508	1.30859
12	0.06179	0.5385	1.07709	1.19859	28	0.12074	0.4511	0.37118	1.30769
13	0.06346	0.5370	1.06766	1.20477	29	0.12141	0.4542	0.42842	1.30664
14	0.06497	0.5372	1.05787	1.21073	30	0.12197	0.4537	0.47885	1.30546
15	+0.06626	−0.5384	+1.04772	+1.21648	31	+0.12259	−0.4498	−0.52391	+1.30413
16	+0.06732	−0.5398	+1.03719	+1.22203	32	+0.12342	−0.4435	−0.56460	+1.30267

$E = +0''.04 = +0^s.002$

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sidereal Hour.)		r	f	f'	G		H		Log g.	Log h.	i	Log i.
			In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
		y	s	s	° ′	h m	° ′	h m			″	
Jan.	0	−0.0013	+0.819	−0.018	314 15.2	20 57.0	351 18.1	23 25.2	0.87334	1.31019	−1.34	−0.1271
	1	+0.0014	0.831	0.014	315 3.1	21 0.2	350 21.7	23 21.4	0.87559	1.30998	1.48	0.1711
	2	0.0042	0.843	−0.007	315 51.4	21 3.4	349 25.2	23 17.7	0.87932	1.30975	1.62	0.2109
	3	0.0069	0.854	+0.001	316 34.5	21 6.3	348 28.7	23 13.9	0.88444	1.30949	1.77	0.2472
	4	0.0097	0.866	0.009	317 7.1	21 8.5	347 32.1	23 10.1	0.89050	1.30922	1.91	0.2806
h	5	0.0124	+0.878	+0.015	317 28.0	21 9.9	346 35.5	23 6.4	0.89676	1.30893	−2.05	−0.3115
(7.0)	6	0.0151	0.889	0.018	317 38.6	21 10.6	345 38.7	23 2.6	0.90256	1.30862	2.19	0.3402
	7	0.0179	0.901	0.017	317 41.6	21 10.8	344 41.9	22 58.8	0.90733	1.30829	2.33	0.3670
	8	0.0206	0.912	0.013	317 42.5	21 10.8	343 45.0	22 55.0	0.91071	1.30795	2.47	0.3921
	9	0.0234	0.924	+0.007	317 45.8	21 11.1	342 48.0	22 51.2	0.91285	1.30758	2.60	0.4157
	10	0.0261	+0.935	0.000	317 54.9	21 11.7	341 51.0	22 47.4	0.91409	1.30718	−2.74	−0.4379
	11	0.0288	0.947	−0.005	318 11.6	21 12.8	340 53.8	22 43.6	0.91485	1.30678	2.88	0.4590
	12	0.0316	0.958	0.009	318 35.6	21 14.4	339 56.5	22 39.8	0.91569	1.30636	3.01	0.4789
	13	0.0343	0.969	0.010	319 4.8	21 16.3	338 59.1	22 35.9	0.91702	1.30593	3.15	0.4978
	14	0.0370	0.980	0.009	319 36.4	21 18.4	338 1.6	22 32.1	0.91914	1.30547	3.28	0.5158
	15	0.0398	+0.991	−0.006	320 7.2	21 20.5	337 4.1	22 28.3	0.92210	1.30500	−3.40	−0.5329
	16	0.0425	1.002	−0.001	320 34.7	21 22.3	336 6.4	22 24.4	0.92586	1.30451	3.54	0.5493
	17	0.0452	1.013	+0.003	320 56.6	21 23.8	335 8.5	22 20.6	0.93019	1.30401	3.67	0.5649
	18	0.0480	1.024	0.007	321 12.4	21 24.8	334 10.6	22 16.7	0.93486	1.30350	3.80	0.5799
	19	0.0507	1.034	0.010	321 21.6	21 25.4	333 12.5	22 12.8	0.93958	1.30297	3.93	0.5942
h	20	0.0535	+1.045	+0.011	321 25.0	21 25.7	332 14.3	22 9.0	0.94402	1.30243	−4.05	−0.6079
(8.0)	21	0.0562	1.055	0.009	321 23.8	21 25.6	331 15.9	22 5.1	0.94791	1.30188	4.18	0.6211
	22	0.0589	1.066	+0.006	321 20.5	21 25.4	330 17.4	22 1.2	0.95100	1.30131	4.30	0.6337
	23	0.0617	1.076	0.000	321 18.0	21 25.2	329 18.8	21 57.3	0.95322	1.30073	4.42	0.6459
	24	0.0644	1.086	−0.006	321 19.4	21 25.3	328 20.0	21 53.3	0.95461	1.30014	4.55	0.6576
	25	0.0672	+1.097	−0.012	321 27.5	21 25.8	327 21.1	21 49.4	0.95542	1.29954	−4.66	−0.6688
	26	0.0699	1.107	0.017	321 43.8	21 26.9	326 22.0	21 45.5	0.95609	1.29893	4.78	0.6796
	27	0.0726	1.117	0.018	322 7.9	21 28.5	325 22.7	21 41.5	0.95718	1.29832	4.90	0.6900
	28	0.0754	1.127	0.016	322 36.8	21 30.5	324 23.3	21 37.6	0.95912	1.29769	5.01	0.7001
	29	0.0781	1.137	0.010	323 6.8	21 32.5	323 23.7	21 33.6	0.96221	1.29706	5.13	0.7098
	30	0.0808	+1.146	−0.003	323 33.1	21 34.2	322 24.0	21 29.6	0.96639	1.29642	−5.24	−0.7191
	31	0.0836	1.156	+0.005	323 52.0	21 35.5	321 24.1	21 25.6	0.97135	1.29577	5.35	0.7281
Feb.	1	0.0863	1.165	0.012	324 1.2	21 36.1	320 24.0	21 21.6	0.97655	1.29512	5.46	0.7368
	2	0.0891	1.175	0.016	324 1.7	21 36.1	319 23.8	21 17.6	0.98140	1.29446	5.56	0.7452
	3	0.0918	1.184	0.016	323 56.5	21 35.8	318 23.4	21 13.6	0.98540	1.29381	5.67	0.7533
h	4	0.0945	+1.193	+0.014	323 49.2	21 35.3	317 22.8	21 9.5	0.98833	1.29315	−5.77	−0.7611
(9.0)	5	0.0973	1.202	0.008	323 43.8	21 34.9	316 22.1	21 5.5	0.99016	1.29249	5.87	0.7686
	6	0.1000	1.211	+0.002	323 43.3	21 34.9	315 21.2	21 1.4	0.99113	1.29182	5.97	0.7759
	7	0.1028	1.220	−0.004	323 49.7	21 35.3	314 20.2	20 57.3	0.99168	1.29116	6.07	0.7829
	8	0.1055	1.229	0.008	324 2.7	21 36.2	313 19.0	20 53.3	0.99220	1.29050	6.16	0.7896
	9	0.1082	+1.238	−0.010	324 20.6	21 37.4	312 17.6	20 49.2	0.99302	1.28984	−6.25	−0.7962
	10	0.1110	1.246	0.009	324 41.0	21 38.7	311 16.1	20 45.1	0.99443	1.28919	6.35	0.8025
	11	0.1137	1.255	0.006	325 1.2	21 40.1	310 14.4	20 41.0	0.99654	1.28853	6.44	0.8085
	12	0.1164	1.263	−0.002	325 18.9	21 41.3	309 12.5	20 36.8	0.99928	1.28787	6.52	0.8144
	13	0.1192	1.272	+0.002	325 32.4	21 42.2	308 10.5	20 32.7	1.00253	1.28723	6.61	0.8200
	14	0.1219	+1.280	+0.006	325 40.7	21 42.7	307 8.4	20 28.6	1.00600	1.28659	−6.69	−0.8254
	15	0.1246	+1.288	+0.009	325 43.9	21 42.9	306 6.1	20 24.4	1.00951	1.28596	−6.77	−0.8306

FOR WASHINGTON MEAN MIDNIGHT.

lar Day. Sidereal Hour.)	τ	f	f′	G		H		Log g.	Log h.	i	Log i.
		In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	s	s	° ′	h m	° ′	h m			″	
Feb. 15	0.1246	+1.288	+0.009	325 43.9	21 42.9	306 6.1	20 24.4	1.00951	1.28596	−6.77	−0.8306
16	0.1274	1.296	0.011	325 42.2	21 42.8	305 3.6	20 20.2	1.01284	1.28533	6.85	0.8356
17	0.1301	1.304	0.010	325 37.2	21 42.5	304 1.0	20 16.1	1.01574	1.28472	6.93	0.8405
18	0.1329	1.312	0.008	325 30.2	21 42.0	302 58.3	20 11.9	1.01803	1.28411	7.00	0.8451
19	0.1356	1.320	+0.003	325 23.7	21 41.6	301 55.4	20 7.7	1.01955	1.28352	7.07	0.8496
h (10.0) 20	0.1383	+1.327	−0.004	325 20.1	21 41.3	300 52.3	20 3.5	1.02037	1.28293	−7.14	−0.8538
21	0.1411	1.335	0.010	325 22.1	21 41.5	299 49.1	19 59.3	1.02063	1.28236	7.21	0.8580
22	0.1438	1.342	0.015	325 31.0	21 42.1	298 45.8	19 55.1	1.02069	1.28180	7.28	0.8619
23	0.1466	1.350	0.017	325 46.9	21 43.1	297 42.3	19 50.8	1.02101	1.28124	7.34	0.8656
24	0.1493	1.357	0.016	326 7.9	21 44.5	296 38.6	19 46.6	1.02189	1.28070	7.40	0.8692
25	0.1520	+1.364	−0.012	326 30.7	21 46.0	295 34.9	19 42.3	1.02367	1.28018	−7.46	−0.8726
26	0.1548	1.372	−0.005	326 51.4	21 47.4	294 31.0	19 38.1	1.02647	1.27968	7.52	0.8759
27	0.1575	1.379	+0.003	327 6.4	21 48.4	293 27.0	19 33.8	1.02997	1.27920	7.57	0.8790
28	0.1602	1.386	0.010	327 13.9	21 48.9	292 22.9	19 29.5	1.03383	1.27873	7.62	0.8820
29	0.1630	1.393	0.015	327 13.7	21 48.9	291 18.7	19 25.2	1.03749	1.27827	7.67	0.8848
Mar. 1	0.1657	+1.400	+0.016	327 7.9	21 48.5	290 14.4	19 21.0	1.04053	1.27783	−7.72	−0.8874
2	0.1685	1.407	0.014	326 59.9	21 48.0	289 10.0	19 16.7	1.04268	1.27742	7.76	0.8899
3	0.1712	1.413	0.009	326 53.1	21 47.5	288 5.5	19 12.4	1.04385	1.27702	7.80	0.8923
4	0.1739	1.420	+0.003	326 50.4	21 47.4	287 1.0	19 8.1	1.04425	1.27664	7.84	0.8945
5	0.1767	1.427	−0.003	326 54.2	21 47.6	285 56.3	19 3.8	1.04415	1.27628	7.88	0.8965
h 1.0) 6	0.1794	+1.434	−0.008	327 4.1	21 48.3	284 51.5	18 59.4	1.04396	1.27595	−7.91	−0.8984
7	0.1822	1.440	0.010	327 19.3	21 49.3	283 46.8	18 55.1	1.04404	1.27564	7.95	0.9002
8	0.1849	1.447	0.010	327 37.5	21 50.5	282 41.9	18 50.8	1.04462	1.27535	7.98	0.9019
9	0.1876	1.453	0.008	327 56.2	21 51.8	281 37.0	18 46.5	1.04577	1.27508	8.01	0.9034
10	0.1904	1.460	−0.004	328 13.1	21 52.9	280 32.1	18 42.1	1.04753	1.27483	8.03	0.9047
11	0.1931	+1.466	+0.001	328 26.8	21 53.8	279 27.2	18 37.8	1.04975	1.27461	−8.05	−0.9059
12	0.1958	1.473	0.005	328 35.8	21 54.4	278 22.2	18 33.5	1.05221	1.27441	8.07	0.9070
13	0.1986	1.479	0.009	328 40.5	21 54.7	277 17.2	18 29.1	1.05476	1.27423	8.09	0.9080
14	0.2013	1.486	0.011	328 40.8	21 54.7	276 12.2	18 24.8	1.05718	1.27408	8.11	0.9088
15	0.2040	1.492	0.011	328 38.0	21 54.5	275 7.2	18 20.5	1.05928	1.27395	8.12	0.9095
16	0.2068	+1.498	+0.009	328 33.5	21 54.2	274 2.2	18 16.1	1.06087	1.27385	−8.13	−0.9100
17	0.2095	1.505	+0.004	328 29.0	21 53.9	272 57.2	18 11.8	1.06185	1.27377	8.14	0.9105
18	0.2123	1.511	−0.001	328 27.1	21 53.8	271 52.3	18 7.5	1.06219	1.27371	8.14	0.9108
19	0.2150	1.517	0.007	328 29.9	21 54.0	270 47.4	18 3.2	1.06204	1.27368	8.15	0.9109
20	0.2177	1.524	0.013	328 38.8	21 54.6	269 42.4	17 58.8	1.06166	1.27369	8.15	0.9110
h 21	0.2205	+1.530	−0.016	328 54.1	21 55.6	268 37.6	17 54.5	1.06137	1.27370	−8.15	−0.9109
12.0) 22	0.2232	1.536	0.016	329 14.9	21 57.0	267 32.7	17 50.2	1.06158	1.27374	8.14	0.9106
23	0.2260	1.543	0.013	329 38.1	21 58.5	266 28.0	17 45.9	1.06258	1.27381	8.13	0.9102
24	0.2287	1.549	−0.007	330 0.4	22 0.0	265 23.3	17 41.6	1.06448	1.27390	8.12	0.9098
25	0.2314	1.555	+0.001	330 18.3	22 1.2	264 18.6	17 37.2	1.06712	1.27402	8.11	0.9091
26	0.2342	+1.562	+0.008	330 29.6	22 2.0	263 14.0	17 32.9	1.07014	1.27416	−8.10	−0.9084
27	0.2369	1.568	0.014	330 33.6	22 2.2	262 9.5	17 28.6	1.07314	1.27432	8.08	0.9075
28	0.2396	1.574	0.016	330 32.0	22 2.1	261 5.0	17 24.3	1.07565	1.27451	8.06	0.9065
29	0.2424	1.581	0.015	330 27.5	22 1.8	260 0.7	17 20.0	1.07738	1.27472	8.04	0.9054
30	0.2451	1.587	0.011	330 23.7	22 1.6	258 56.4	17 15.8	1.07825	1.27495	8.02	0.9041
31	0.2479	+1.594	+0.005	330 23.4	22 1.6	257 52.3	17 11.5	1.07838	1.27520	−7.99	−0.9027
pr. 1	0.2506	+1.600	−0.002	330 28.8	22 1.9	256 48.3	17 7.2	1.07803	1.27548	−7.96	−0.901

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sidereal Hour.)	τ	f	f′	G		H		Log g.	Log h.	i	Log i.
		In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	s	s	° ′	h m	° ′	h m			″	
Apr. 1	0.2506	+1.600	−0.002	330 28.8	22 1.9	256 48.3	17 7.2	1.07803	1.27548	−7.96	−0.9011
2	0.2533	1.607	0.007	330 40.7	22 2.7	255 44.4	17 3.0	1.07754	1.27577	7.93	0.8994
3	0.2561	1.614	0.010	330 57.9	22 3.9	254 40.6	16 58.7	1.07729	1.27609	7.90	0.8976
4	0.2588	1.620	0.011	331 18.4	22 5.2	253 37.0	16 54.5	1.07749	1.27643	7.87	0.8957
5	0.2616	1.627	0.009	331 40.0	22 6.7	252 33.5	16 50.2	1.07830	1.27679	7.83	0.8936
h (13.0) 6	0.2643	+1.634	−0.005	332 0.2	22 8.0	251 30.1	16 46.0	1.07968	1.27717	−7.79	−0.8914
7	0.2670	1.640	−0.001	332 17.5	22 9.2	250 26.9	16 41.8	1.08152	1.27757	7.75	0.8891
8	0.2698	1.647	+0.004	332 30.6	22 10.0	249 23.9	16 37.6	1.08365	1.27798	7.70	0.8866
9	0.2725	1.654	0.007	332 39.4	22 10.6	248 21.0	16 33.4	1.08588	1.27841	7.65	0.8839
10	0.2752	1.661	0.010	332 44.2	22 10.9	247 18.3	16 29.2	1.08801	1.27886	7.60	0.8811
11	0.2780	+1.668	+0.010	332 45.7	22 11.0	246 15.8	16 25.1	1.08986	1.27933	−7.55	−0.8782
12	0.2807	1.675	0.009	332 45.6	22 11.0	245 13.4	16 20.9	1.09131	1.27981	7.50	0.8751
13	0.2834	1.682	+0.005	332 45.3	22 11.0	244 11.2	16 16.7	1.09226	1.28030	7.45	0.8719
14	0.2862	1.689	0.000	332 47.0	22 11.1	243 9.2	16 12.6	1.09269	1.28080	7.39	0.8686
15	0.2889	1.697	−0.006	332 52.9	22 11.5	242 7.4	16 8.5	1.09262	1.28133	7.33	0.8650
16	0.2917	+1.704	−0.012	333 4.1	22 12.3	241 5.8	16 4.4	1.09233	1.28186	−7.27	−0.8614
17	0.2944	1.711	0.015	333 21.5	22 13.4	240 4.3	16 0.3	1.09217	1.28241	7.20	0.8575
18	0.2971	1.719	0.016	333 44.0	22 14.9	239 3.1	15 56.2	1.09241	1.28297	7.14	0.8535
19	0.2999	1.726	0.014	334 9.4	22 16.6	238 2.0	15 52.1	1.09338	1.28354	7.07	0.8494
20	0.3026	1.734	0.008	334 34.4	22 18.3	237 1.1	15 48.1	1.09517	1.28412	7.00	0.8451
h (14.0) 21	0.3054	+1.742	−0.001	334 55.7	22 19.7	236 0.5	15 44.0	1.09771	1.28470	−6.93	−0.8406
22	0.3081	1.749	+0.007	335 10.9	22 20.7	235 0.0	15 40.0	1.10067	1.28530	6.85	0.8359
23	0.3108	1.757	0.013	335 19.5	22 21.3	233 59.7	15 36.0	1.10367	1.28590	6.78	0.8311
24	0.3136	1.765	0.017	335 22.1	22 21.5	232 59.6	15 32.0	1.10631	1.28651	6.70	0.8261
25	0.3163	1.773	0.017	335 21.3	22 21.4	231 59.7	15 28.0	1.10827	1.28713	6.62	0.8209
26	0.3190	+1.781	+0.013	335 20.4	22 21.4	231 0.0	15 24.0	1.10944	1.28775	−6.54	−0.8155
27	0.3218	1.789	0.007	335 22.5	22 21.5	230 0.5	15 20.0	1.10989	1.28837	6.46	0.8100
28	0.3245	1.798	+0.001	335 29.6	22 22.0	229 1.2	15 16.1	1.10986	1.28900	6.37	0.8042
29	0.3273	1.806	−0.005	335 42.8	22 22.9	228 2.1	15 12.1	1.10970	1.28963	6.28	0.7982
30	0.3300	1.814	0.009	336 1.1	22 24.1	227 3.2	15 8.2	1.10973	1.29026	6.19	0.7920
May 1	0.3327	+1.823	−0.011	336 22.9	22 25.5	226 4.5	15 4.3	1.11019	1.29090	−6.10	−0.7856
2	0.3355	1.832	0.010	336 46.0	22 27.1	225 6.0	15 0.4	1.11126	1.29153	6.01	0.7790
3	0.3382	1.840	0.007	337 7.9	22 28.5	224 7.7	14 56.5	1.11289	1.29216	5.92	0.7722
4	0.3410	1.849	−0.002	337 26.7	22 29.8	223 9.6	14 52.6	1.11497	1.29280	5.82	0.7651
5	0.3437	1.858	+0.002	337 41.7	22 30.8	222 11.7	14 48.8	1.11736	1.29343	5.73	0.7578
h (15.0) 6	0.3464	+1.867	+0.006	337 52.4	22 31.5	221 14.0	14 44.9	1.11982	1.29406	−5.63	−0.7503
7	0.3492	1.876	0.009	337 59.2	22 31.9	220 16.4	14 41.1	1.12222	1.29468	5.53	0.7425
8	0.3519	1.885	0.010	338 2.8	22 32.2	219 19.1	14 37.3	1.12434	1.29530	5.43	0.7344
9	0.3546	1.894	0.009	338 4.6	22 32.3	218 22.0	14 33.5	1.12611	1.29592	5.32	0.7261
10	0.3574	1.903	0.006	338 6.0	22 32.4	217 25.0	14 29.7	1.12745	1.29653	5.22	0.7174
11	0.3601	+1.913	+0.001	338 8.9	22 32.6	216 28.3	14 25.9	1.12834	1.29714	−5.11	−0.7085
12	0.3628	1.922	−0.005	338 14.9	22 33.0	215 31.7	14 22.1	1.12881	1.29774	5.00	0.6993
13	0.3656	1.932	0.011	338 25.8	22 33.7	214 35.4	14 18.4	1.12910	1.29834	4.89	0.6897
14	0.3683	1.941	0.015	338 42.0	22 34.8	213 39.2	14 14.6	1.12945	1.29892	4.78	0.6798
15	0.3711	1.951	0.017	339 2.9	22 36.2	212 43.1	14 10.9	1.13021	1.29949	4.67	0.6696
16	0.3738	+1.961	−0.016	339 26.3	22 37.7	211 47.3	14 7.2	1.13158	1.30006	−4.56	−0.6590
17	0.3765	+1.971	−0.011	339 50.3	22 39.3	210 51.7	14 3.4	1.13370	1.30063	−4.45	−0.6480

FOR WASHINGTON MEAN MIDNIGHT.

lar Day. Sidereal Hour.)	τ	f	f'	G		H		Log g.	Log h.	i	Log i.
		In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	s	s	° ′	h m	° ′	h m			″	
lay 17	0.3765	+1.971	−0.011	339 50.3	22 39.3	210 51.7	14 3.4	1.13370	1.30063	−4.45	−0.6480
18	0.3793	1.981	−0.004	340 11.1	22 40.7	209 56.2	13 59.7	1.13654	1.30118	4.33	0.6366
19	0.3820	1.991	+0.004	340 26.2	22 41.7	209 0.8	13 56.1	1.13980	1.30172	4.21	0.6247
20	0.3848	2.001	0.012	340 35.1	22 42.3	208 5.6	13 52.4	1.14318	1.30224	4.10	0.6124
21	0.3875	2.011	0.017	340 38.2	22 42.5	207 10.5	13 48.7	1.14625	1.30276	3.98	0.5997
h (16.0) 22	0.3902	+2.021	+0.018	340 37.6	22 42.5	206 15.6	13 45.0	1.14872	1.30326	−3.86	−0.5864
23	0.3930	2.031	0.015	340 36.3	22 42.4	205 20.9	13 41.4	1.15047	1.30375	3.74	0.5726
24	0.3957	2.042	0.010	340 37.0	22 42.5	204 26.3	13 37.8	1.15152	1.30423	3.62	0.5582
25	0.3984	2.052	+0.003	340 42.0	22 42.8	203 31.8	13 34.1	1.15208	1.30470	3.49	0.5432
26	0.4012	2.062	−0.003	340 52.5	22 43.5	202 37.4	13 30.5	1.15249	1.30515	3.37	0.5275
27	0.4039	+2.073	−0.008	341 7.7	22 44.5	201 43.2	13 26.9	1.15301	1.30559	−3.24	−0.5111
28	0.4067	2.083	0.010	341 26.4	22 45.8	200 49.0	13 23.3	1.15392	1.30602	3.12	0.4940
29	0.4094	2.094	0.010	341 46.2	22 47.1	199 55.0	13 19.7	1.15538	1.30642	2.99	0.4760
30	0.4121	2.105	0.008	342 5.1	22 48.3	199 1.2	13 16.1	1.15734	1.30682	2.87	0.4572
31	0.4149	2.116	−0.003	342 21.3	22 49.4	198 7.4	13 12.5	1.15973	1.30720	2.74	0.4373
June 1	0.4176	+2.127	+0.001	342 33.8	22 50.3	197 13.8	13 8.9	1.16241	1.30756	−2.61	−0.4164
2	0.4204	2.137	0.005	342 42.2	22 50.8	196 20.2	13 5.3	1.16514	1.30791	2.48	0.3943
3	0.4231	2.148	0.009	342 46.9	22 51.1	195 26.7	13 1.8	1.16779	1.30824	2.35	0.3709
4	0.4258	2.159	0.010	342 48.6	22 51.2	194 33.4	12 58.2	1.17025	1.30855	2.22	0.3461
5	0.4286	2.170	0.010	342 48.3	22 51.2	193 40.1	12 54.7	1.17235	1.30884	2.09	0.3196
h 17.0) 6	0.4313	+2.181	+0.007	342 47.4	22 51.2	192 46.9	12 51.1	1.17406	1.30912	−1.96	−0.2913
7	0.4340	2.192	+0.002	342 47.4	22 51.2	191 53.8	12 47.6	1.17536	1.30938	1.82	0.2608
8	0.4368	2.203	−0.003	342 50.0	22 51.3	191 0.8	12 44.1	1.17630	1.30962	1.69	0.2280
9	0.4395	2.215	0.010	342 56.4	22 51.8	190 7.9	12 40.5	1.17702	1.30985	1.56	0.1924
10	0.4422	2.226	0.015	343 7.4	22 52.5	189 15.0	12 37.0	1.17777	1.31006	1.42	0.1534
11	0.4450	+2.237	−0.018	343 22.5	22 53.5	188 22.2	12 33.5	1.17881	1.31025	−1.29	−0.1106
12	0.4477	2.248	0.018	343 40.5	22 54.7	187 29.4	12 30.0	1.18037	1.31042	1.16	0.0628
13	0.4505	2.259	0.014	343 58.7	22 55.9	186 36.7	12 26.4	1.18258	1.31057	1.02	0.0091
14	0.4532	2.271	−0.007	344 14.8	22 57.0	185 44.0	12 22.9	1.18543	1.31071	0.89	9.9476
15	0.4559	2.282	+0.001	344 26.5	22 57.8	184 51.4	12 19.4	1.18873	1.31082	0.75	9.8758
16	0.4587	+2.293	+0.009	344 32.4	22 58.2	183 58.8	12 15.9	1.19217	1.31092	−0.62	−9.7897
17	0.4614	2.304	0.015	344 33.1	22 58.2	183 6.3	12 12.4	1.19541	1.31100	0.48	9.6820
18	0.4642	2.316	0.018	344 29.8	22 58.0	182 13.8	12 8.9	1.19817	1.31106	0.35	9.5383
19	0.4669	2.327	0.017	344 25.2	22 57.7	181 21.2	12 5.4	1.20024	1.31110	0.21	9.3218
20	0.4696	2.338	0.013	344 22.1	22 57.5	180 28.7	12 1.9	1.20170	1.31112	−0.07	−8.8704
h (18.0) 21	0.4724	+2.350	+0.006	344 22.3	22 57.5	179 36.2	11 58.4	1.20265	1.31112	+0.06	+8.7882
22	0.4751	2.361	0.000	344 27.2	22 57.8	178 43.7	11 54.9	1.20333	1.31110	0.20	9.2945
23	0.4778	2.372	−0.006	344 36.6	22 58.4	177 51.2	11 51.4	1.20409	1.31107	0.33	9.5218
24	0.4806	2.384	0.009	344 49.2	22 59.3	176 58.7	11 47.9	1.20511	1.31101	0.47	9.6702
25	0.4833	2.395	0.009	345 3.4	23 0.2	176 6.2	11 44.4	1.20660	1.31093	0.60	9.7805
26	0.4861	+2.406	−0.008	345 17.0	23 1.1	175 13.7	11 40.9	1.20853	1.31083	+0.74	+9.8683
27	0.4888	2.418	−0.004	345 28.4	23 1.9	174 21.0	11 37.4	1.21082	1.31073	0.87	9.9412
28	0.4915	2.429	0.000	345 36.5	23 2.4	173 28.4	11 33.9	1.21340	1.31060	1.01	0.0035
29	0.4943	2.440	+0.005	345 40.9	23 2.7	172 35.7	11 30.4	1.21604	1.31044	1.14	0.0578
30	0.4970	2.451	0.008	345 41.9	23 2.8	171 43.1	11 26.9	1.21862	1.31027	1.28	0.1060
uly 1	0.4998	+2.463	+0.011	345 40.4	23 2.7	170 50.4	11 23.4	1.22101	1.31008	+1.41	+0.1493
2	0.5025	+2.474	+0.011	345 36.6	23 2.4	169 57.6	11 19.8	1.22310	1.30988	+1.54	+0.1885

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sidereal Hour.)	τ	f	f′	G		H		Log g.	Log h.	i	Log i.
		In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	s	s	° ′	h m	° ′	h m			″	
July 1	0.4998	+2.463	+0.011	345 40.4	23 2.7	170 50.4	11 23.4	1.22101	1.31008	+1.41	+0.1493
2	0.5025	2.474	0.011	345 36.6	23 2.4	169 57.6	11 19.8	1.22310	1.30988	1.54	0.1885
3	0.5052	2.485	0.009	345 32.1	23 2.1	169 4.8	11 16.3	1.22482	1.30966	1.68	0.2244
4	0.5080	2.496	+0.004	345 28.3	23 1.9	168 11.9	11 12.8	1.22616	1.30942	1.81	0.2574
5	0.5107	2.507	−0.001	345 26.3	23 1.8	167 19.0	11 9.3	1.22717	1.30916	1.94	0.2880
h (19.0) 6	0.5134	+2.518	−0.007	345 27.5	23 1.8	166 26.0	11 5.7	1.22796	1.30888	+2.07	+0.3164
7	0.5162	2.529	0.013	345 32.5	23 2.2	165 32.9	11 2.2	1.22867	1.30858	2.20	0.3430
8	0.5189	2.540	0.017	345 41.3	23 2.8	164 39.8	10 58.7	1.22958	1.30827	2.33	0.3680
9	0.5216	2.551	0.019	345 52.9	23 3.5	163 46.6	10 55.1	1.23088	1.30795	2.46	0.3914
10	0.5244	2.561	0.016	346 5.4	23 4.4	162 53.3	10 51.6	1.23270	1.30761	2.59	0.4136
11	0.5271	+2.572	−0.011	346 16.6	23 5.1	162 0.0	10 48.0	1.23512	1.30725	+2.72	+0.4345
12	0.5299	2.583	−0.003	346 24.5	23 5.6	161 6.5	10 44.4	1.23798	1.30688	2.85	0.4544
13	0.5326	2.594	+0.005	346 27.6	23 5.8	160 12.9	10 40.9	1.24103	1.30648	2.97	0.4733
14	0.5353	2.604	0.012	346 25.8	23 5.7	159 19.3	10 37.3	1.24401	1.30608	3.10	0.4913
15	0.5381	2.615	0.016	346 20.3	23 5.4	158 25.5	10 33.7	1.24662	1.30566	3.22	0.5084
16	0.5408	+2.625	+0.016	346 12.9	23 4.9	157 31.6	10 30.1	1.24866	1.30523	+3.35	+0.5248
17	0.5436	2.636	0.014	346 6.1	23 4.4	156 37.6	10 26.5	1.25011	1.30478	3.47	0.5405
18	0.5463	2.646	0.008	346 2.1	23 4.1	155 43.5	10 22.9	1.25107	1.30432	3.59	0.5556
19	0.5490	2.656	+0.002	346 2.1	23 4.1	154 49.2	10 19.3	1.25171	1.30384	3.72	0.5700
20	0.5518	2.666	−0.004	346 6.3	23 4.4	153 54.8	10 15.7	1.25230	1.30336	3.84	0.5838
h (20.0) 21	0.5545	+2.677	−0.008	346 13.9	23 4.9	153 0.3	10 12.0	1.25308	1.30286	+3.96	+0.5971
22	0.5572	2.687	0.009	346 23.3	23 5.6	152 5.6	10 8.4	1.25424	1.30235	4.07	0.6099
23	0.5600	2.697	0.008	346 32.9	23 6.2	151 10.9	10 4.7	1.25578	1.30182	4.19	0.6222
24	0.5627	2.707	−0.005	346 40.8	23 6.7	150 15.9	10 1.1	1.25769	1.30129	4.31	0.6340
25	0.5655	2.717	0.000	346 46.0	23 7.1	149 20.7	9 57.4	1.25981	1.30075	4.42	0.6455
26	0.5682	+2.727	+0.004	346 48.0	23 7.2	148 25.5	9 53.7	1.26204	1.30019	+4.53	+0.6565
27	0.5709	2.736	0.008	346 46.9	23 7.1	147 30.1	9 50.0	1.26423	1.29963	4.65	0.6671
28	0.5737	2.746	0.011	346 43.1	23 6.9	146 34.6	9 46.3	1.26626	1.29906	4.76	0.6774
29	0.5764	2.756	0.011	346 37.6	23 6.5	145 38.8	9 42.6	1.26803	1.29849	4.87	0.6873
30	0.5792	2.765	0.010	346 31.2	23 6.1	144 42.9	9 38.9	1.26950	1.29790	4.98	0.6968
31	0.5819	+2.774	+0.007	346 25.1	23 5.7	143 46.9	9 35.1	1.27062	1.29730	+5.08	+0.7061
Aug. 1	0.5846	2.784	+0.001	346 20.6	23 5.4	142 50.6	9 31.4	1.27141	1.29670	5.19	0.7150
2	0.5874	2.793	−0.005	346 18.2	23 5.2	141 54.2	9 27.6	1.27195	1.29610	5.29	0.7236
3	0.5901	2.802	0.011	346 19.4	23 5.3	140 57.7	9 23.8	1.27238	1.29548	5.40	0.7320
4	0.5928	2.811	0.016	346 24.1	23 5.6	140 0.9	9 20.1	1.27290	1.29496	5.50	0.7401
h 5	0.5956	+2.820	−0.018	346 31.6	23 6.1	139 4.0	9 16.3	1.27370	1.29425	+5.60	+0.7479
(21.0) 6	0.5983	2.829	0.018	346 40.7	23 6.7	138 6.9	9 12.5	1.27492	1.29362	5.69	0.7554
7	0.6010	2.838	0.013	346 49.3	23 7.3	137 9.6	9 8.6	1.27665	1.29301	5.79	0.7628
8	0.6038	2.847	−0.007	346 55.6	23 7.7	136 12.2	9 4.8	1.27884	1.29238	5.89	0.7698
9	0.6065	2.855	+0.001	346 57.9	23 7.9	135 14.5	9 1.0	1.28128	1.29175	5.98	0.7767
10	0.6093	+2.864	+0.009	346 55.9	23 7.7	134 16.7	8 57.1	1.28375	1.29112	+6.07	+0.7833
11	0.6120	2.872	0.014	346 50.2	23 7.3	133 18.7	8 53.2	1.28597	1.29049	6.16	0.7897
12	0.6147	2.881	0.015	346 42.3	23 6.8	132 20.6	8 49.4	1.28772	1.28987	6.25	0.7959
13	0.6175	2.889	0.014	346 34.3	23 6.3	131 22.2	8 45.5	1.28896	1.28924	6.34	0.8018
14	0.6202	2.897	0.009	346 28.4	23 5.9	130 23.6	8 41.6	1.28969	1.28863	6.42	0.8076
15	0.6230	+2.905	+0.003	346 25.9	23 5.7	129 24.9	8 37.7	1.29008	1.28800	+6.51	+0.8132
16	*0.6257*	*+2.914*	*−0.003*	346 27.5	23 5.8	128 26.0	8 33.7	1.29037	1.28739	+6.59	+0.8186

FOR WASHINGTON MEAN MIDNIGHT.

lar Day. Sidereal Hour.)	τ	f	f′	G		H		Log g.	Log h.	i	Log i.
		In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	s	s	° ′	h m	° ′	h m			″	
Aug. 16	0.6257	+2.914	−0.003	346 27.5	23 5.8	128 26.0	8 33.7	1.29037	1.28739	+6.59	+0.8186
17	0.6284	2.922	0.007	346 32.6	23 6.2	127 26.8	8 29.8	1.29076	1.28678	6.67	0.8238
18	0.6312	2.930	0.009	346 40.1	23 6.7	126 27.5	8 25.8	1.29143	1.28618	6.74	0.8289
19	0.6339	2.937	0.008	346 48.3	23 7.2	125 28.0	8 21.9	1.29244	1.28558	6.82	0.8337
20	0.6366	2.945	0.005	346 55.4	23 7.7	124 28.3	8 17.9	1.29381	1.28499	6.89	0.8384
h (22.0) 21	0.6394	+2.953	−0.001	347 0.3	23 8.0	123 28.3	8 13.9	1.29543	1.28440	+6.96	+0.8429
22	0.6421	2.960	+0.004	347 2.5	23 8.2	122 28.2	8 9.9	1.29716	1.28383	7.04	0.8473
23	0.6449	2.968	0.008	347 1.7	23 8.1	121 28.0	8 5.9	1.29890	1.28326	7.10	0.8514
24	0.6476	2.975	0.011	346 58.6	23 7.9	120 27.5	8 1.8	1.30051	1.28270	7.17	0.8555
25	0.6503	2.982	0.012	346 53.5	23 7.6	119 26.8	7 57.8	1.30191	1.28216	7.23	0.8594
26	0.6531	+2.990	+0.011	346 47.5	23 7.2	118 26.0	7 53.7	1.30304	1.28162	+7.30	+0.8631
27	0.6558	2.997	0.008	346 41.6	23 6.8	117 25.0	7 49.7	1.30385	1.28110	7.36	0.8666
28	0.6586	3.004	+0.004	346 36.8	23 6.5	116 23.8	7 45.6	1.30437	1.28059	7.41	0.8700
29	0.6613	3.011	−0.002	346 34.1	23 6.3	115 22.5	7 41.5	1.30463	1.28009	7.47	0.8733
30	0.6640	3.018	0.008	346 34.4	23 6.3	114 20.9	7 37.4	1.30475	1.27960	7.52	0.8764
31	0.6668	+3.025	−0.014	346 38.0	23 6.5	113 19.3	7 33.3	1.30488	1.27914	+7.58	+0.8794
Sept. 1	0.6695	3.032	0.017	346 44.4	23 7.0	112 17.4	7 29.2	1.30520	1.27869	7.62	0.8822
2	0.6722	3.039	0.017	346 53.0	23 7.5	111 15.4	7 25.0	1.30588	1.27825	7.67	0.8849
3	0.6750	3.046	0.014	347 1.8	23 8.1	110 13.3	7 20.9	1.30703	1.27783	7.72	0.8875
4	0.6777	3.052	0.009	347 9.0	23 8.6	109 11.0	7 16.7	1.30858	1.27741	7.76	0.8899
h 23.0) 5	0.6804	+3.059	−0.001	347 13.2	23 8.9	108 8.6	7 12.6	1.31047	1.27703	+7.80	+0.8922
6	0.6832	3.066	+0.006	347 13.3	23 8.9	107 6.0	7 8.4	1.31243	1.27668	7.84	0.8943
7	0.6859	3.072	0.012	347 9.7	23 8.6	106 3.3	7 4.2	1.31428	1.27633	7.88	0.8963
8	0.6887	3.079	0.014	347 3.7	23 8.2	105 0.5	7 0.0	1.31573	1.27600	7.91	0.8982
9	0.6914	3.085	0.014	346 56.9	23 7.8	103 57.6	6 55.8	1.31672	1.27569	7.94	0.8999
10	0.6941	+3.092	+0.010	346 51.6	23 7.4	102 54.6	6 51.6	1.31724	1.27541	+7.97	+0.9016
11	0.6969	3.098	+0.004	346 49.3	23 7.3	101 51.4	6 47.4	1.31741	1.27514	8.00	0.9030
12	0.6996	3.104	−0.002	346 50.9	23 7.4	100 48.1	6 43.2	1.31740	1.27489	8.02	0.9044
13	0.7024	3.111	0.007	346 56.2	23 7.7	99 44.7	6 39.0	1.31744	1.27466	8.05	0.9056
14	0.7051	3.117	0.010	347 4.2	23 8.3	98 41.3	6 34.8	1.31774	1.27447	8.07	0.9067
15	0.7078	+3.123	−0.009	347 13.4	23 8.9	97 37.7	6 30.5	1.31837	1.27429	+8.09	+0.9077
16	0.7106	3.130	0.007	347 22.2	23 9.5	96 34.0	6 26.3	1.31933	1.27413	8.10	0.9085
17	0.7133	3.136	−0.003	347 29.3	23 10.0	95 30.3	6 22.0	1.32058	1.27400	8.12	0.9093
18	0.7160	3.142	+0.002	347 33.9	23 10.3	94 26.5	6 17.8	1.32199	1.27388	8.13	0.9098
19	0.7188	3.148	0.007	347 35.6	23 10.4	93 22.7	6 13.5	1.32342	1.27380	8.13	0.9103
h (0.0) 20	0.7215	+3.154	+0.010	347 35.1	23 10.3	92 18.7	6 9.2	1.32477	1.27374	+8.14	+0.9106
21	0.7242	3.161	0.012	347 32.5	23 10.2	91 14.7	6 5.0	1.32591	1.27369	8.15	0.9109
22	0.7270	3.167	0.012	347 29.0	23 9.9	90 10.6	6 0.7	1.32685	1.27368	8.15	0.9110
23	0.7297	3.173	0.010	347 25.4	23 9.7	89 6.5	5 56.4	1.32750	1.27369	8.15	0.9109
24	0.7325	3.179	+0.005	347 22.6	23 9.5	88 2.4	5 52.2	1.32787	1.27373	8.14	0.9107
25	0.7352	+3.185	0.000	347 21.5	23 9.4	86 58.3	5 47.9	1.32801	1.27378	+8.14	+0.9104
26	0.7379	3.192	−0.006	347 23.2	23 9.5	85 54.1	5 43.6	1.32799	1.27385	8.13	0.9100
27	0.7407	3.198	0.012	347 27.9	23 9.9	84 49.9	5 39.3	1.32794	1.27396	8.12	0.9095
28	0.7434	3.204	0.015	347 35.6	23 10.4	83 45.7	5 35.0	1.32805	1.27409	8.11	0.9088
29	0.7462	3.210	0.017	347 45.5	23 11.0	82 41.6	5 30.8	1.32846	1.27424	8.09	0.9080
30	0.7489	+3.216	−0.015	347 56.2	23 11.8	81 37.4	5 26.5	1.32926	1.27441	+8.07	+0.9070
Oct. 1	0.7516	+3.223	−0.010	348 6.0	23 12.4	80 33.3	5 22.2	1.33052	1.27460	+8.05	+0.9060

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sidereal Hour.)		τ	f	f′	G		H		Log g.	Log h.	i	Log i.
			In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
		y	s	s	° ′	h m	° ′	h m			″	
Oct.	1	0.7516	+3.223	−0.010	348 6.0	23 12.4	80 33.3	5 22.2	1.33052	1.27460	+8.05	+0.9060
	2	0.7544	3.229	−0.003	348 13.3	23 12.9	79 29.2	5 18.0	1.33209	1.27483	8.03	0.9048
	3	0.7571	3.235	+0.004	348 17.0	23 13.1	78 25.1	5 13.7	1.33383	1.27508	8.01	0.9034
h	4	0.7598	3.242	0.010	348 17.0	23 13.1	77 21.1	5 9.4	1.33552	1.27534	7.98	0.9019
(1.0)	5	0.7626	3.248	0.014	348 14.2	23 12.9	76 17.1	5 5.1	1.33694	1.27563	7.95	0.9003
	6	0.7653	+3.254	+0.014	348 10.2	23 12.7	75 13.2	5 0.9	1.33792	1.27593	+7.92	+0.8986
	7	0.7681	3.261	0.011	348 7.1	23 12.5	74 9.3	4 56.6	1.33845	1.27626	7.88	0.8967
	8	0.7708	3.267	+0.006	348 6.5	23 12.4	73 5.5	4 52.4	1.33863	1.27661	7.85	0.8947
	9	0.7735	3.274	0.000	348 9.3	23 12.6	72 1.8	4 48.1	1.33858	1.27698	7.81	0.8925
	10	0.7763	3.281	−0.006	348 15.9	23 13.1	70 58.2	4 43.9	1.33853	1.27737	7.77	0.8902
	11	0.7790	+3.287	−0.010	348 25.5	23 13.7	69 54.6	4 39.6	1.33872	1.27777	+7.72	+0.8878
	12	0.7818	3.294	0.010	348 36.9	23 14.5	68 51.1	4 35.4	1.33920	1.27820	7.68	0.8852
	13	0.7845	3.301	0.008	348 48.0	23 15.2	67 47.7	4 31.2	1.34006	1.27864	7.63	0.8824
	14	0.7872	3.308	−0.005	348 57.8	23 15.9	66 44.5	4 27.0	1.34124	1.27911	7.58	0.8796
	15	0.7900	3.315	0.000	349 5.4	23 16.4	65 41.3	4 22.7	1.34259	1.27959	7.53	0.8765
	16	0.7927	+3.322	+0.005	349 10.3	23 16.7	64 38.1	4 18.5	1.34403	1.28008	+7.47	+0.8733
	17	0.7954	3.329	0.009	349 12.7	23 16.8	63 35.1	4 14.3	1.34540	1.28059	7.41	0.8700
	18	0.7982	3.336	0.011	349 13.1	23 16.9	62 32.3	4 10.2	1.34661	1.28112	7.35	0.8665
	19	0.8009	3.343	0.012	349 12.4	23 16.8	61 29.5	4 6.0	1.34760	1.28165	7.29	0.8628
h	20	0.8036	3.350	0.010	349 11.3	23 16.7	60 26.9	4 1.8	1.34836	1.28221	7.23	0.8590
(2.0)	21	0.8064	+3.358	+0.006	349 10.8	23 16.7	59 24.3	3 57.6	1.34887	1.28278	+7.16	+0.8549
	22	0.8091	3.365	+0.001	349 11.7	23 16.8	58 21.9	3 53.5	1.34914	1.28336	7.09	0.8508
	23	0.8119	3.372	−0.004	349 15.0	23 17.0	57 19.6	3 49.3	1.34928	1.28394	7.02	0.8464
	24	0.8146	3.380	0.010	349 21.0	23 17.4	56 17.5	3 45.2	1.34938	1.28454	6.95	0.8419
	25	0.8173	3.388	0.014	349 29.9	23 18.0	55 15.6	3 41.0	1.34960	1.28516	6.87	0.8372
	26	0.8201	+3.395	−0.016	349 41.0	23 18.7	54 13.7	3 36.9	1.35008	1.28576	+6.80	+0.8322
	27	0.8228	3.403	0.015	349 53.3	23 19.6	53 12.0	3 32.8	1.35094	1.28638	6.72	0.8271
	28	0.8256	3.411	0.011	350 5.0	23 20.3	52 10.3	3 28.7	1.35223	1.28702	6.63	0.8218
	29	0.8283	3.419	−0.005	350 14.7	23 21.0	51 8.9	3 24.6	1.35387	1.28765	6.55	0.8163
	30	0.8310	3.427	+0.003	350 21.1	23 21.4	50 7.7	3 20.5	1.35572	1.28829	6.47	0.8106
	31	0.8338	+3.436	+0.010	350 23.9	23 21.6	49 6.6	3 16.4	1.35754	1.28894	+6.38	+0.8047
Nov.	1	0.8365	3.444	0.014	350 23.6	23 21.6	48 5.6	3 12.4	1.35916	1.28958	6.29	0.7986
	2	0.8392	3.452	0.015	350 21.8	23 21.5	47 4.8	3 8.3	1.36041	1.29023	6.20	0.7922
	3	0.8420	3.461	0.013	350 20.0	23 21.3	46 4.2	3 4.3	1.36122	1.29090	6.10	0.7856
h	4	0.8447	3.469	0.008	350 20.2	23 21.3	45 3.6	3 0.2	1.36167	1.29155	6.01	0.7788
(3.0)	5	0.8475	+3.478	+0.002	350 23.4	23 21.6	44 3.3	2 56.2	1.36188	1.29221	+5.91	+0.7717
	6	0.8502	3.487	−0.004	350 30.3	23 22.0	43 3.1	2 52.2	1.36207	1.29286	5.81	0.7643
	7	0.8529	3.496	0.009	350 40.2	23 22.7	42 3.1	2 48.2	1.36242	1.29352	5.71	0.7567
	8	0.8557	3.505	0.011	350 51.9	23 23.5	41 3.2	2 44.2	1.36307	1.29417	5.61	0.7489
	9	0.8584	3.514	0.010	351 4.0	23 24.3	40 3.5	2 40.2	1.36408	1.29482	5.50	0.7407
	10	0.8612	+3.523	−0.006	351 14.9	23 25.0	39 4.0	2 36.3	1.36540	1.29547	+5.40	+0.7322
	11	0.8639	3.532	−0.002	351 23.7	23 25.6	38 4.6	2 32.3	1.36696	1.29611	5.29	0.7234
	12	0.8666	3.541	+0.003	351 29.8	23 26.0	37 5.3	2 28.4	1.36861	1.29675	5.18	0.7144
	13	0.8694	3.551	0.008	351 33.4	23 26.2	36 6.1	2 24.4	1.37021	1.29738	5.07	0.7049
	14	0.8721	3.560	0.011	351 34.9	23 26.3	35 7.1	2 20.5	1.37169	1.29800	4.96	0.6951
	15	0.8748	+3.570	+0.012	351 35.1	23 26.3	34 8.3	2 16.6	1.37298	1.29861	+4.84	+0.6850
	16	*0.8776*	*+3.580*	*+0.010*	351 34.7	23 26.3	33 9.6	2 12.6	1.37405	1.29923	+4.73	+0.6745

FOR WASHINGTON MEAN MIDNIGHT.

olar Day. (Sidereal Hour.)	τ	*f*	*f′*	*G*		*H*		Log *g*.	Log *h*.	*i*	Log *i*.
		In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	s	s	° ′	h m	° ′	h m			″	
Nov. 16	0.8776	+3.580	+0.010	351 34.7	23 26.3	33 9.6	2 12.6	1.37405	1.29923	+4.73	+0.6745
17	0.8803	3.589	0.007	351 34.6	23 26.3	32 11.0	2 8.7	1.37486	1.29983	4.61	0.6635
18	0.8830	3.599	+0.003	351 35.6	23 26.4	31 12.5	2 4.8	1.37547	1.30042	4.49	0.6522
h 19	0.8858	3.609	−0.003	351 38.5	23 26.6	30 14.2	2 0.9	1.37593	1.30100	4.37	0.6403
(4.0) 20	0.8885	3.620	0.009	351 43.7	23 26.9	29 16.0	1 57.1	1.37635	1.30157	4.25	0.6280
21	0.8913	+3.630	−0.014	351 51.5	23 27.4	28 17.9	1 53.2	1.37684	1.30212	+4.12	+0.6152
22	0.8940	3.640	0.017	352 1.5	23 28.1	27 20.0	1 49.3	1.37755	1.30268	4.00	0.6019
23	0.8967	3.650	0.017	352 12.8	23 28.9	26 22.2	1 45.5	1.37861	1.30321	3.87	0.5880
24	0.8995	3.661	0.013	352 23.7	23 29.6	25 24.5	1 41.6	1.38008	1.30372	3.74	0.5735
25	0.9022	3.671	−0.007	352 33.1	23 30.2	24 26.9	1 37.8	1.38186	1.30422	3.62	0.5584
26	0.9050	+3.682	0.000	352 39.6	23 30.6	23 29.4	1 34.0	1.38391	1.30472	+3.49	+0.5425
27	0.9077	3.693	+0.008	352 42.6	23 30.8	22 32.0	1 30.1	1.38600	1.30520	3.36	0.5259
28	0.9104	3.703	0.013	352 42.5	23 30.8	21 34.7	1 26.3	1.38792	1.30566	3.22	0.5085
29	0.9132	3.714	0.016	352 40.3	23 30.7	20 37.6	1 22.5	1.38953	1.30611	3.09	0.4902
30	0.9159	3.725	0.015	352 37.7	23 30.5	19 40.5	1 18.7	1.39074	1.30653	2.96	0.4710
ec. 1	0.9186	+3.736	+0.011	352 36.5	23 30.4	18 43.5	1 14.9	1.39155	1.30695	+2.82	+0.4508
2	0.9214	3.747	+0.005	352 37.8	23 30.5	17 46.7	1 11.1	1.39208	1.30734	2.69	0.4294
3	0.9241	3.758	−0.002	352 42.3	23 30.8	16 49.9	1 7.3	1.39254	1.30772	2.55	0.4067
h 4	0.9269	3.769	0.007	352 49.9	23 31.3	15 53.2	1 3.5	1.39311	1.30807	2.41	0.3827
.0) 5	0.9296	3.781	0.010	352 59.2	23 31.9	14 56.6	0 59.8	1.39391	1.30842	2.28	0.3571
6	0.9323	+3.792	−0.010	353 9.3	23 32.6	14 0.0	0 56.0	1.39509	1.30874	+2.14	+0.3297
7	0.9351	3.803	0.007	353 18.5	23 33.2	13 3.5	0 52.2	1.39654	1.30904	2.00	0.3003
8	0.9378	3.815	−0.003	353 25.8	23 33.7	12 7.1	0 48.5	1.39821	1.30932	1.86	0.2687
9	0.9406	3.826	+0.002	353 30.6	23 34.0	11 10.8	0 44.7	1.40001	1.30959	1.72	0.2344
10	0.9433	3.838	0.007	353 32.9	23 34.2	10 14.5	0 41.0	1.40180	1.30983	1.57	0.1970
11	0.9460	+3.849	+0.010	353 33.0	23 34.2	9 18.2	0 37.2	1.40348	1.31005	+1.43	+0.1559
12	0.9488	3.861	0.012	353 31.7	23 34.1	8 22.0	0 33.5	1.40497	1.31026	1.29	0.1104
13	0.9515	3.872	0.011	353 29.6	23 34.0	7 25.8	0 29.7	1.40622	1.31044	1.15	0.0594
14	0.9542	3.884	0.008	353 27.6	23 33.8	6 29.6	0 26.0	1.40725	1.31060	1.00	0.0013
15	0.9570	3.895	+0.004	353 26.4	23 33.8	5 33.5	0 22.2	1.40809	1.31074	0.86	9.9342
16	0.9597	+3.907	−0.002	353 26.7	23 33.8	4 37.4	0 18.5	1.40875	1.31085	+0.72	+9.8545
17	0.9624	3.919	0.008	353 29.0	23 33.9	3 41.3	0 14.8	1.40935	1.31095	0.57	9.7566
18	0.9652	3.930	0.013	353 33.5	23 34.2	2 45.2	0 11.0	1.40997	1.31102	0.43	9.6299
19	0.9679	3.942	0.017	353 40.1	23 34.7	1 49.2	0 7.3	1.41076	1.31108	0.28	9.4500
h 20	0.9707	3.954	0.018	353 48.0	23 35.2	0 53.1	0 3.5	1.41183	1.31111	+0.14	+9.1369
(6.0) 21	0.9734	+3.966	−0.016	353 56.1	23 35.7	359 57.0	23 59.8	1.41325	1.31112	−0.01	−7.8927
22	0.9761	3.977	0.011	354 3.0	23 36.2	359 1.0	23 56.1	1.41500	1.31110	0.15	9.1838
23	0.9789	3.989	−0.003	354 7.5	23 36.5	358 4.8	23 52.3	1.41702	1.31107	0.30	9.4736
24	0.9816	4.001	+0.005	354 8.8	23 36.6	357 8.6	23 48.6	1.41912	1.31102	0.44	9.6457
25	0.9844	4.012	0.011	354 7.3	23 36.5	356 12.5	23 44.8	1.42112	1.31095	0.59	9.7686
26	0.9871	+4.024	+0.015	354 3.4	23 36.2	355 16.3	23 41.1	1.42287	1.31084	−0.73	−9.8642
27	0.9898	4.036	0.016	353 58.5	23 35.9	354 20.1	23 37.3	1.42426	1.31072	0.88	9.9424
28	0.9926	4.047	0.013	353 54.4	23 35.6	353 23.9	23 33.6	1.42522	1.31058	1.02	0.0084
29	0.9953	4.059	0.007	353 52.4	23 35.5	352 27.6	23 29.8	1.42592	1.31041	1.16	0.0657
30	0.9980	4.070	+0.001	353 53.3	23 35.6	351 31.3	23 26.1	1.42647	1.31023	1.31	0.1161
31	1.0008	+4.082	−0.005	353 57.0	23 35.8	350 34.9	23 22.3	1.42704	1.31003	−1.45	−0.1612
32	1.0035	+4.094	−0.008	354 2.9	23 36.2	349 38.5	23 18.6	1.42779	1.30980	−1.59	−0.2010

FOR WASHINGTON SIDEREAL TWELVE HOURS.

Mean Solar Date.	Log A_1.	Log B_1.	Log C.	Log D.	f	G_1	H	Log g_1.	Log h.	Log i.
					s	° ′	° ′			
Jan. 0.72	+9.4261	−0.7301	−0.5001	+1.3049	+0.822	314 52	351 6	0.8796	1.3101	−0.1373
10.70	9.4834	0.7326	0.8049	1.2845	0.936	318 28	341 40	0.9111	1.3071	0.4422
20.67	9.5314	0.7394	0.9729	1.2486	1.047	321 9	332 5	0.9419	1.3023	0.6101
30.64	9.5714	0.7487	1.0831	1.1944	1.147	323 7	322 16	0.9704	1.2963	0.7204
Feb. 9.61	9.6046	0.7586	1.1596	1.1168	1.239	324 35	312 11	0.9955	1.2898	0.7969
19.59	+9.6323	−0.7674	−1.2127	+1.0056	+1.320	325 45	301 50	1.0170	1.2835	−0.8500
29.56	9.6557	0.7733	1.2477	0.8375	1.393	326 49	291 15	1.0351	1.2782	0.8849
Mar. 10.53	9.6762	0.7754	1.2675	+0.5355	1.460	327 55	280 30	1.0502	1.2748	0.9048
20.50	9.6947	0.7729	1.2737	−8.9881	1.524	329 9	269 42	1.0630	1.2737	0.9110
30.48	9.7125	0.7655	1.2668	0.5569	1.587	330 36	258 58	1.0744	1.2749	0.9041
Apr. 9.45	+9.7304	−0.7534	−1.2468	−0.8443	+1.654	332 15	248 24	1.0854	1.2784	−0.8840
19.42	9.7489	0.7371	1.2125	1.0063	1.726	334 6	238 7	1.0969	1.2835	0.8497
29.40	9.7685	0.7176	1.1616	1.1139	1.805	336 5	228 8	1.1096	1.2896	0.7989
May 9.37	9.7892	0.6961	1.0899	1.1894	1.893	338 4	218 29	1.1238	1.2958	0.7272
19.34	9.8107	0.6743	0.9894	1.2428	1.989	339 59	209 9	1.1398	1.3016	0.6266
29.31	+9.8327	−0.6541	−0.8422	−1.2791	+2.091	341 42	200 5	1.1572	1.3064	−0.4795
June 8.29	9.8547	0.6372	0.5981	1.3012	2.201	343 11	191 12	1.1757	1.3096	0.2354
18.26	9.8763	0.6251	−9.9402	1.3107	2.313	344 22	182 26	1.1946	1.3110	−9.5775
28.23	9.8969	0.6188	+0.3504	1.3080	2.426	345 16	173 42	1.2134	1.3106	+9.9876
July 8.20	9.9163	0.6184	0.7235	1.2932	2.537	345 54	164 55	1.2316	1.3084	0.3608
18.18	+9.9341	−0.6231	+0.9135	−1.2653	+2.643	346 18	156 1	1.2487	1.3045	+0.5508
28.15	9.9502	0.6315	1.0365	1.2224	2.743	346 32	146 54	1.2644	1.2993	0.6738
Aug. 7.12	9.9646	0.6418	1.1228	1.1610	2.835	346 39	137 31	1.2785	1.2932	0.7600
17.10	9.9772	0.6521	1.1845	1.0749	2.918	346 43	127 51	1.2910	1.2870	0.8218
27.07	9.9883	0.6604	1.2278	0.9509	2.994	346 48	117 51	1.3020	1.2813	0.8651
Sept. 6.04	+9.9982	−0.6651	+1.2561	−0.7569	+3.063	346 57	107 35	1.3116	1.2768	+0.8933
16.01	0.0072	0.6650	1.2709	−0.3653	3.127	347 13	97 5	1.3201	1.2742	0.9082
25.99	0.0157	0.6591	1.2730	+0.0655	3.188	347 37	86 27	1.3280	1.2738	0.9102
Oct. 5.96	0.0242	0.6470	1.2623	0.6656	3.251	348 11	75 48	1.3355	1.2758	0.8995
15.93	0.0330	0.6284	1.2379	0.9020	3.318	348 53	65 14	1.3433	1.2798	0.8752
25.90	+0.0425	−0.6040	+1.1979	+1.0457	+3.391	349 42	54 51	1.3516	1.2854	+0.8352
Nov. 4.88	0.0528	0.5746	1.1389	1.1437	3.472	350 35	44 41	1.3608	1.2918	0.7761
14.85	0.0641	0.5422	1.0544	1.2128	3.564	351 28	34 47	1.3710	1.2982	0.6917
24.82	0.0762	0.5094	0.9314	1.2608	3.664	352 18	25 6	1.3821	1.3039	0.5687
Dec. 4.79	0.0889	0.4795	0.7381	1.2919	3.773	353 0	15 37	1.3941	1.3082	0.3754
14.77	+0.1018	−0.4560	+0.3471	+1.3081	+3.887	353 34	6 15	1.4066	1.3106	+9.9844
24.74	0.1146	0.4417	−0.0413	1.3104	4.004	353 57	356 55	1.4191	1.3110	−9.6785
34.71	+0.1270	−0.4380	−0.6425	+1.2989	+4.119	354 10	347 34	1.4313	1.3092	−0.2798

$E = +0^s.002$

The above numbers give the same reductions from mean to apparent place as are employed in computing the apparent places of the fixed stars, given on pages 316 to 513, from the mean places, given on pages 217 to 230. In order to render exact interpolation possible through intervals of ten *days, all short period terms* have been omitted.

FOR WASHINGTON MEAN MIDNIGHT.

Date.	δ″ψ	δ″ω	Date.	δ″ψ	δ″ω	Date.	δ″ψ	δ″ω	Date.	δ″ψ	δ″ω
	″	″		″	″		″	″		″	″
Jan. 0	−0.29	−0.02	Feb. 15	+0.15	−0.05	Apr. 1	−0.03	+0.10	May 17	−0.18	−0.08
1	0.23	0.07	16	0.18	−0.02	2	0.12	0.07	18	−0.06	0.10
2	−0.12	0.10	17	0.17	+0.02	3	0.17	+0.03	19	+0.07	0.10
3	+0.01	0.11	18	0.12	0.06	4	0.18	−0.02	20	0.19	0.08
4	0.15	0.09	19	+0.04	0.09	5	0.15	0.05	21	0.27	−0.03
5	+0.25	−0.05	20	−0.06	+0.10	6	−0.09	−0.08	22	+0.29	+0.02
6	0.29	0.00	21	0.16	0.09	7	−0.02	0.09	23	0.25	0.07
7	0.28	+0.05	22	0.24	0.06	8	+0.06	0.09	24	0.17	0.10
8	0.21	0.09	23	0.28	+0.01	9	0.12	0.07	25	+0.06	0.10
9	0.11	0.10	24	0.27	−0.04	10	0.16	−0.04	26	−0.05	0.09
10	+0.01	+0.10	25	−0.20	−0.08	11	+0.17	0.00	27	−0.13	+0.06
11	−0.08	0.07	26	−0.08	0.10	12	0.14	+0.04	28	0.17	+0.01
12	0.14	+0.03	27	+0.04	0.10	13	+0.09	0.07	29	0.16	−0.03
13	0.16	−0.01	28	0.16	0.08	14	0.00	0.09	30	0.12	0.07
14	0.14	0.05	29	0.24	−0.03	15	−0.10	0.10	31	−0.06	0.09
15	−0.09	−0.08	Mar. 1	+0.26	+0.02	16	−0.19	+0.08	June 1	+0.02	−0.09
16	−0.02	0.09	2	0.23	0.07	17	0.25	+0.04	2	0.09	0.08
17	+0.05	0.09	3	0.15	0.10	18	0.27	0.00	3	0.14	0.06
18	0.11	0.07	4	+0.05	0.10	19	0.23	−0.05	4	0.17	−0.02
19	0.16	−0.04	5	−0.05	0.09	20	0.14	0.09	5	0.16	+0.02
20	+0.17	0.00	6	−0.13	+0.06	21	−0.01	−0.10	6	+0.12	+0.05
21	0.15	+0.04	7	0.16	+0.02	22	+0.11	0.10	7	+0.04	0.08
22	+0.09	0.07	8	0.16	−0.03	23	0.22	0.06	8	−0.06	0.09
23	0.00	0.10	9	0.13	0.06	24	0.27	−0.02	9	0.16	0.09
24	−0.10	0.10	10	−0.06	0.09	25	0.27	+0.04	10	0.24	0.07
25	−0.20	+0.08	11	+0.01	−0.09	26	+0.21	+0.08	11	−0.29	+0.03
26	0.28	+0.04	12	0.08	0.08	27	0.12	0.10	12	0.29	−0.02
27	0.30	0.00	13	0.14	0.06	28	+0.01	0.10	13	0.23	0.07
28	0.26	−0.05	14	0.17	−0.03	29	−0.09	0.08	14	−0.12	0.10
29	0.17	0.09	15	0.17	+0.01	30	0.15	+0.04	15	+0.01	0.10
30	−0.04	−0.11	16	+0.14	+0.05	May 1	−0.18	0.00	16	+0.14	−0.09
31	+0.09	0.10	17	+0.07	0.08	2	0.16	−0.04	17	0.24	−0.05
Feb. 1	0.20	0.06	18	−0.02	0.10	3	0.11	0.08	18	0.29	0.00
2	0.26	−0.02	19	0.12	0.09	4	−0.04	0.09	19	0.27	+0.05
3	0.27	+0.04	20	0.21	0.07	5	+0.04	0.09	20	0.21	0.09
4	+0.22	+0.08	21	−0.26	+0.03	6	+0.10	−0.08	21	+0.11	+0.10
5	0.13	0.10	22	0.26	−0.02	7	0.15	0.05	22	0.00	0.10
6	+0.03	0.10	23	0.21	0.07	8	0.16	−0.01	23	−0.09	0.07
7	−0.06	0.08	24	−0.11	0.10	9	0.15	+0.03	24	0.15	+0.03
8	0.13	+0.05	25	+0.02	0.10	10	0.10	0.06	25	0.16	−0.02
9	−0.16	0.00	26	+0.14	−0.09	11	+0.02	+0.09	26	−0.13	−0.06
10	0.15	−0.04	27	0.23	−0.05	12	−0.08	0.10	27	−0.07	0.08
11	0.11	0.07	28	0.27	0.00	13	0.18	0.08	28	+0.01	0.09
12	−0.04	0.09	29	0.25	+0.05	14	0.25	0.05	29	0.08	0.09
13	+0.03	0.09	30	0.18	0.09	15	0.28	+0.01	30	0.14	0.07
14	+0.10	−0.08	31	+0.08	+0.10	16	−0.26	−0.04	July 1	+0.17	−0.03
15	+0.15	−0.05	Apr. 1	−0.03	+0.10	17	−0.18	−0.08	2	+0.11	

FOR WASHINGTON MEAN MIDNIGHT.

Date.	$\delta''\psi$	$\delta''\omega$	Date.	$\delta''\psi$	$\delta''\omega$	Date.	$\delta''\psi$	$\delta''\omega$	Date.	$\delta''\psi$	$\delta''\omega$
	″	″		″	″		″	″		″	″
July 1	+0.17	−0.03	Aug. 16	−0.05	+0.09	Oct. 1	−0.16	−0.09	Nov. 16	+0.17	+0.02
2	0.17	0.00	17	0.12	0.05	2	−0.05	0.10	17	0.12	0.06
3	0.14	+0.04	18	0.15	+0.01	3	+0.07	0.09	18	+0.04	0.08
4	+0.07	0.07	19	0.14	−0.04	4	0.17	0.06	19	−0.05	0.09
5	−0.02	0.09	20	0.09	0.07	5	0.23	−0.01	20	0.15	0.08
6	−0.12	+0.09	21	−0.02	−0.09	6	+0.23	+0.04	21	−0.23	+0.06
7	0.22	0.08	22	+0.06	0.09	7	0.18	0.08	22	0.27	+0.02
8	0.29	+0.04	23	0.13	0.08	8	+0.09	0.10	23	0.27	−0.02
9	0.30	−0.01	24	0.17	0.05	9	−0.01	0.10	24	0.22	0.06
10	0.27	0.05	25	0.19	−0.02	10	0.10	0.08	25	−0.12	0.09
11	−0.18	−0.09	26	+0.18	+0.02	11	−0.16	+0.04	26	0.00	−0.10
12	−0.06	0.10	27	0.14	0.06	12	0.17	−0.01	27	+0.13	0.08
13	+0.08	0.09	28	+0.06	0.08	13	0.14	0.05	28	0.22	−0.05
14	0.19	0.06	29	−0.03	0.09	14	−0.08	0.08	29	0.26	0.00
15	0.26	−0.01	30	0.13	0.09	15	0.00	0.09	30	0.25	+0.05
16	+0.27	+0.04	31	−0.22	+0.06	16	+0.08	−0.09	Dec. 1	+0.18	+0.09
17	0.22	0.08	Sept. 1	0.28	+0.02	17	0.15	0.07	2	+0.08	0.10
18	0.14	0.10	2	0.28	−0.02	18	0.18	−0.04	3	−0.03	0.09
19	+0.03	0.10	3	0.23	0.06	19	0.19	0.00	4	0.12	0.06
20	−0.06	0.08	4	0.14	0.09	20	0.16	+0.04	5	0.16	+0.02
21	−0.13	+0.04	5	−0.02	−0.10	21	+0.11	+0.07	6	−0.16	−0.02
22	0.15	−0.01	6	+0.10	0.08	22	+0.02	0.09	7	0.12	0.06
23	0.13	0.05	7	0.19	−0.05	23	−0.07	0.09	8	−0.05	0.09
24	−0.07	0.08	8	0.24	0.00	24	0.17	0.08	9	+0.03	0.09
25	0.00	0.09	9	0.22	+0.05	25	0.24	0.05	10	0.11	0.08
26	+0.07	−0.09	10	+0.16	+0.09	26	−0.27	+0.01	11	+0.16	−0.06
27	0.14	0.07	11	+0.07	0.10	27	0.25	−0.04	12	0.19	−0.02
28	0.18	0.04	12	−0.03	0.09	28	0.18	0.08	13	0.18	+0.01
29	0.19	−0.01	13	0.11	0.07	29	−0.08	0.10	14	0.14	0.05
30	0.16	+0.03	14	0.16	+0.02	30	+0.05	0.10	15	+0.07	0.08
31	+0.11	+0.07	15	−0.15	−0.02	31	+0.16	−0.07	16	−0.03	+0.09
Aug. 1	+0.02	0.09	16	0.11	0.06	Nov. 1	0.23	−0.03	17	0.13	0.09
2	−0.08	0.09	17	−0.05	0.09	2	0.25	+0.02	18	0.22	0.07
3	0.18	0.08	18	+0.03	0.09	3	0.21	0.07	19	0.28	+0.03
4	0.26	0.05	19	0.11	0.08	4	0.13	0.10	20	0.29	−0.01
5	−0.30	+0.01	20	+0.16	−0.06	5	+0.03	+0.10	21	−0.26	−0.05
6	0.29	−0.04	21	0.19	−0.03	6	−0.07	0.09	22	0.17	0.08
7	0.22	0.08	22	0.19	+0.01	7	0.15	0.05	23	−0.05	0.10
8	−0.11	0.10	23	0.16	0.05	8	0.17	+0.01	24	+0.07	0.09
9	+0.02	0.10	24	+0.09	0.07	9	0.16	−0.04	25	0.18	0.06
10	+0.14	−0.07	25	0.00	+0.09	10	−0.10	−0.07	26	+0.25	−0.01
11	0.22	−0.03	26	−0.10	0.09	11	−0.03	0.09	27	0.26	+0.04
12	0.25	+0.02	27	0.19	0.07	12	+0.06	0.09	28	0.21	0.08
13	0.22	0.07	28	0.25	+0.04	13	0.13	0.08	29	0.12	0.10
14	0.15	0.10	29	0.27	−0.01	14	0.17	0.05	30	+0.02	0.10
15	*+0.05*	+0.10	30	−0.24	−0.05	15	+0.19	−0.01	31	−0.08	+0.08
16	*−0.05*	*+0.09*	*Oct. 1*	−0.16	−0.09	16	+0.17	+0.02	32	−0.14	+0.04

FOR JANUARY 0$^{\rm d}$.975, WASHINGTON MEAN TIME.

Name of Star.	Magnitude.	Spectrum.	Right Ascension.			Annual Variation.	Annual P. M.	Declination.			Annual Variation.	Annual P. M.
			h	m	s	s	s	°	′	″	″	″
33 Piscium	4.7	K0	0	1	2.184	+3.0714	−.0006	− 6	10	38.90	+20.136	+0.091
α Andromedæ (*Alpheratz*)	2.2	A0p	0	4	2.546	3.0962	+.0107	+28	37	36.11	19.880	−0.163
β Cassiopeiæ	2.4	F5	0	4	41.242	3.1856	+.0680	+58	41	11.42	19.861	−0.180
ε Phœnicis	3.9	K0	0	5	9.038	3.0510	+.0096	−46	12	39.56	19.848	−0.193
22 Andromedæ	5.1	F0	0	5	57.008	3.1101	+.0021	+45	36	17.41	20.034	−0.004
γ Pegasi	2.9	B2	0	8	54.507	+3.0866	+.0003	+14	42	59.83	+20.020	−0.010
σ Andromedæ	4.5	A2	0	13	56.123	3.1279	−.0044	+36	19	10.37	19.962	−0.047
ι Ceti	3.8	K0	0	15	8.902	3.0569	−.0013	− 9	17	22.15	19.972	−0.030
ζ Tucanæ	4.3	F8	0	15	42.336	3.1470	+.2739	−65	22	5.12	21.170	+1.172
44 Piscium	6.0	G5	0	21	5.761	3.0744	−.0014	+ 1	28	28.25	19.937	−0.023
β Hydri	2.9	G0	0	21	21.425	+3.1985	+.6975	−77	43	38.37	+20.277	+0.318
α Phœnicis	2.4	K0	0	22	8.145	2.9722	+.0188	−42	45	43.75	19.549	−0.403
12 Ceti	6.0	K5	0	25	45.133	3.0622	+.0011	− 4	25	16.57	19.919	0.000
13 Ceti †	5.2	G0	0	30	55.429	3.0871	+.0273	− 4	3	18.18	19.846	−0.017
ζ Cassiopeiæ	3.7	B2	0	32	17.061	3.3292	+.0036	+53	26	5.23	19.840	−0.007
π Andromedæ	4.4	B3	0	32	23.421	+3.1980	+.0019	+33	15	25.61	+19.846	0.000
ε Andromedæ	4.5	G5	0	34	6.788	3.1646	−.0172	+28	51	20.97	19.570	−0.254
δ Andromedæ	3.5	K0	0	34	49.946	3.2023	+.0110	+30	24	4.85	19.717	−0.097
α Cassiopeiæ (*Schedir*) †	*var.*	K0	0	35	43.885	3.3875	+.0063	+56	4	36.64	19.771	−0.032
μ Phœnicis	4.6	K0	0	37	21.444	2.8391	−.0046	−46	32	46.93	19.748	−0.032
β Ceti	2.2	K0	0	39	22.431	+3.0124	+.0160	−18	26	50.64	+19.792	+0.041
ο Cassiopeiæ	4.7	B2	0	40	2.285	3.3318	+.0028	+47	49	29.55	19.734	−0.006
21 Cassiopeiæ	5.6	A2	0	40	4.601	3.9077	−.0050	+74	31	44.93	19.713	−0.026
ζ Andromedæ	4.3	K0	0	42	52.972	3.1750	−.0073	+23	48	37.52	19.618	−0.078
η Cassiopeiæ †	3.6	F8	0	44	0.577	3.6142	+.1432	+57	22	16.35	19.201	−0.476
δ Piscium	4.6	K5	0	44	19.361	+3.1102	+.0055	+ 7	7	41.35	+19.628	−0.044
λ Hydri	5.0	K5	0	45	41.158	2.1007	+.0426	−75	22	49.23	19.648	−0.001
20 Ceti	4.9	K0	0	48	42.811	3.0642	−.0005	− 1	36	0.06	19.591	−0.003
γ Cassiopeiæ	2.2	B0p	0	51	37.632	3.5987	+.0036	+60	15	43.70	19.534	−0.005
μ Andromedæ	3.9	A2	0	52	5.138	3.3214	+.0132	+38	2	38.24	19.560	+0.030
α Sculptoris	4.4	B5	0	54	33.480	+2.8904	−.0018	−29	48	41.17	+19.468	−0.013
ε Piscium	4.4	K0	0	58	34.919	3.1113	−.0054	+ 7	26	17.32	19.420	+0.026
β Phœnicis †	3.4	K0	1	2	20.127	2.6796	−.0057	−47	10	7.34	19.284	−0.024
μ Cassiopeiæ	5.3	G5	1	2	40.235	3.9705	+.3918	+54	30	31.99	17.746	−1.555
η Ceti	3.6	K0	1	4	21.845	3.0175	+.0143	−10	37	37.79	19.134	−0.125
β Andromedæ	2.4	Ma	1	5	1.411	+3.3511	+.0148	+35	10	31.73	+19.127	−0.117
τ Piscium	4.7	K0	1	7	1.793	3.2975	+.0056	+29	38	38.39	19.166	−0.029
ζ Piscium †	5.6	A5	1	9	20.465	3.1320	+.0096	+ 7	7	53.28	19.083	−0.052
κ Tucanæ †	5.0	F8	1	12	55.270	2.0394	+.0744	−69	19	20.40	19.128	+0.089
f Piscium	5.3	A2	1	13	27.895	3.0927	−.0033	+ 3	10	20.65	18.999	−0.025
υ Piscium	4.7	A2	1	14	50.728	+3.2910	+.0016	+26	49	22.39	+18.977	−0.008
θ Ceti	3.8	K0	1	19	49.446	2.9978	−.0057	− 8	36	59.31	18.627	−0.215
δ Cassiopeiæ	2.8	A5	1	20	18.542	3.9014	+.0406	+59	47	57.48	18.790	−0.037
γ Phœnicis	3.4	K5	1	24	43.107	2.6076	−.0029	−43	44	54.70	18.466	−0.225
38 Cassiopeiæ	6.0	F5	1	24	57.396	4.4170	+.0263	+69	49	58.33	18.612	−0.072
η Piscium	3.7	G5	1	26	59.130	+3.2060	+.0015	+14	54	47.45	+18.616	−0.003
40 Cassiopeiæ	5.5	K0	1	31	46.572	4.7352	−.0011	+72	36	45.24	18.458	−0.002
υ Andromedæ	4.2	G0	1	31	51.637	3.5103	−.0153	+40	59	8.80	18.080	−0.377
π Piscium	5.6	F0	1	32	38.574	3.1767	−.0049	+11	42	43.88	18.464	+0.034
υ Persei	3.8	K0	1	32	49.688	3.6680	+.0064	+48	12	10.96	18.304	−0.119
α Eridani (*Achernar*)	0.6	B5	1	34	35.215	+2.2363	+.0104	−57	39	47.99	+18.322	−0.041
ω Cassiopeiæ	5.5	A0p	1	36	6.007	4.4028	+.0088	+67	37	7.51	18.307	−0.002
ν Piscium	4.7	K0	1	37	3.497	3.1198	−.0015	+ 5	3	46.67	18.278	+0.003
φ Persei	4.2	B0p	1	38	23.218	3.7449	+.0031	+50	15	57.89	18.210	−0.015
τ Ceti	3.6	K0	1	40	9.908	2.7866	−.1198	−16	22	45.85	19.020	+0.859
ο Piscium	4.5	K0	1	40	57.351	+3.1651	+.0049	+ 8	44	7.28	+18.177	+0.045
ε Sculptoris †	5.4	F0	1	41	42.486	+2.8045	+.0052	−25	28	18.88	+18.052	−0.051

13 Ceti, dup. 5$^{\rm m}$.5, 6$^{\rm m}$.2, 0″.3
α Cassiop., var. irreg. 2$^{\rm m}$.2, 2$^{\rm m}$.8
η Cassiop. comp. 7$^{\rm m}$.6, 4″ s. pr.

β Phœnicis, dup. 4$^{\rm m}$.1, 4$^{\rm m}$.1, 1″.
ζ Piscium, star 6$^{\rm m}$.5, 24″ n. f.

κ Tucanæ, comp. 7$^{\rm m}$, 6″ n.
ε Sculptoris, comp. 9$^{\rm m}$, 5″ n. f.

MEAN PLACES OF TEN-DAY STARS, 1916.

FOR JANUARY $0^d.975$, WASHINGTON MEAN TIME.

Name of Star.	Magnitude.	Spectrum.	Right Ascension.	Annual Variation.	Annual P. M.	Declination.	Annual Variation.	Annual P. M.
			h m s	s	s	° ′ ″	″	″
ζ Ceti	3.9	K0	1 47 18.824	+2.9601	+.0020	−10 44 58.29	+17.861	−0.027
α Trianguli	3.6	F5	1 48 17.332	3.4136	+.0015	+29 10 12.50	17.618	−0.231
ε Cassiopeiæ	3.4	B3	1 48 20.201	4.2854	+.0053	+63 15 25.37	17.832	−0.015
ξ Piscium	4.8	K0	1 49 12.319	3.1038	+.0015	+ 2 46 23.92	17.833	+0.021
β Arietis	2.7	A5	1 49 59.749	3.3085	+.0064	+20 23 52.37	17.670	−0.111
ψ Phœnicis	4.4	Mb	1 50 16.598	+2.4036	−.0124	−46 42 50.53	+17.665	−0.104
υ Ceti	4.2	K5	1 56 2.792	2.8257	+.0082	−21 29 3.65	17.522	−0.008
α Hydri	3.0	F0	1 56 6.963	1.8818	+.0277	−61 58 41.94	17.554	+0.027
50 Cassiopeiæ	4.1	A0	1 56 13.963	5.0629	−.0092	+72 0 55.96	17.542	+0.020
γ Andromedæ *pr.*	2.3	K0	1 58 44.191	3.6716	+.0046	+41 55 38.10	17.364	−0.051
γ Andromedæ *seq.*	5.1	A	Δα +0.842	....	...	Δδ + 4.58	....	...
α Arietis	2.2	K2	2 2 26.052	+3.3763	+.0139	+23 3 56.89	+17.108	−0.144
β Trianguli	3.1	A5	2 4 32.403	3.5618	+.0126	+34 35 25.87	17.114	−0.044
55 Cassiopeiæ	6.2	F5	2 7 52.281	4.6696	−.0020	+66 7 53.27	17.003	−0.002
6 Persei	5.4	K0	2 8 0.582	3.9740	+.0368	+50 40 34.43	16.832	−0.167
ξ^1 Ceti	4.5	G5	2 8 32.733	+3.1770	−.0012	+ 8 27 11.13	+16.958	−0.016
μ Fornacis	5.2	A0	2 9 12.269	2.6378	−.0037	−31 7 3.96	16.921	−0.022
γ Trianguli	4.1	A0	2 12 18.931	3.5587	+.0040	+33 27 33.48	16.745	−0.052
67 Ceti	5.7	G5	2 12 47.543	2.9907	+.0054	− 6 48 31.69	16.663	−0.110
φ Eridani	3.8	B8	2 13 30.414	2.1412	+.0062	−51 54 2.59	16.711	−0.029
o Ceti (*Mira*) †	*var.*	Md	2 15 6.121	+3.0292	+.0002	− 3 21 30.26	+16.434	−0.229
κ Fornacis	5.4	F5	2 18 41.901	2.7448	+.0138	−24 11 51.70	16.408	−0.077
δ Hydri	4.3	A2	2 20 14.958	1.0586	−.0097	−69 2 28.91	16.427	+0.020
ι Cassiopeiæ †	4.6	A5p	2 22 7.604	4.9043	−.0003	+67 1 32.18	16.323	+0.010
ξ^2 Ceti	4.3	A0	2 23 41.431	3.1865	+.0025	+ 8 5 2.97	16.226	−0.007
σ Ceti	4.8	F5	2 28 6.275	+2.8415	−.0063	−15 36 45.35	+15.901	−0.102
36 H. Cassiopeiæ	5.3	K0	2 30 0.986	5.6404	−.0052	+72 27 6.78	15.920	+0.017
ν Ceti	5.0	G5	2 31 27.821	+3.1452	−.0025	+ 5 13 38.55	15.806	−0.018
μ Hydri	5.3	K0	2 33 25.067	−1.3486	+.0426	−79 28 33.79	15.681	−0.038
ν Arietis	5.4	A2	2 34 2.605	+3.4022	+.0001	+21 35 55.63	15.664	−0.021
δ Ceti	4.0	B2	2 35 10.534	+3.0732	+.0011	− 0 1 59.38	+15.628	+0.004
ε Hydri	4.3	B9	2 38 17.548	0.9142	+.0169	−68 37 36.20	15.456	+0.005
θ Persei	4.2	G0	2 38 27.276	4.0838	+.0353	+48 52 26.40	15.355	−0.087
γ Ceti *seq.* †	3.7	A0	2 38 56.770	3.1060	−.0096	+ 2 52 56.70	15.264	−0.151
π Ceti	4.4	B5	2 40 7.415	2.8538	−.0012	−14 12 49.84	15.337	−0.012
μ Ceti	4.4	A5	2 40 23.914	+3.2395	+.0188	+ 9 45 36.78	+15.308	−0.025
η Persei †	3.9	K0	2 44 33.586	4.3583	+.0041	+55 32 52.02	15.085	−0.012
41 Arietis	3.7	B8	2 45 2.107	3.5251	+.0050	+26 54 54.20	14.958	−0.111
β Fornacis	4.5	K0	2 45 34.504	2.5121	+.0080	−32 45 29.75	15.193	+0.156
σ Arietis	5.5	B5	2 46 51.120	3.3082	+.0016	+14 44 11.38	14.929	−0.034
τ^2 Eridani	4.8	K0	2 47 13.613	+2.7200	−.0044	−21 20 58.54	+14.925	−0.017
τ Persei	4.1	G0p	2 48 17.574	4.2370	+.0008	+52 25 10.56	14.876	−0.003
η Eridani	4.0	K0	2 52 19.399	2.9302	+.0060	− 9 13 54.52	14.426	−0.213
ε Arietis (*mean*) †	4.6	A2	2 54 24.310	3.4256	−.0009	+21 0 18.17	14.506	−0.010
47 H. Cephei	5.7	Ma	2 54 51.755	7.8531	−.0102	+79 5 18.03	14.498	+0.010
θ Eridani †	3.4	A2	2 55 4.687	+2.2767	−.0025	−40 38 26.84	+14.500	+0.024
α Ceti	2.8	Ma	2 57 53.189	3.1333	−.0009	+ 3 45 39.08	14.226	−0.078
τ^3 Eridani	4.2	A3	2 58 41.300	2.6449	−.0104	−23 57 10.96	14.211	−0.044
γ Persei	3.1	G0p	2 58 42.207	4.3286	+.0010	+53 10 42.50	14.250	−0.004
ρ Persei †	*var.*	Mb	2 59 47.281	3.8356	+.0116	+38 30 55.88	14.072	−0.115
μ Horologii	5.2	F0	3 1 37.770	+1.4078	−.0123	−60 3 46.89	+14.019	−0.054
θ Hydri	5.5	B8	3 2 4.223	0.1009	+.0034	−72 13 49.75	14.060	+0.014
β Persei (*Algol*) †	*var.*	B8	3 2 41.830	3.8938	+.0008	+40 37 58.42	14.005	−0.002
δ Arietis	4.5	K0	3 6 49.362	3.4263	+.0110	+19 24 35.44	13.747	+0.001
12 Eridani †	4.0	F8	3 8 30.108	2.5467	+.0241	−29 19 3.72	14.275	+0.636
48 H. Cephei	5.5	F0	3 9 36.856	+7.5042	+.0204	+77 25 39.91	+13.512	−0.055
ζ Arietis	5.0	A0	3 10 4.187	+3.4438	−.0019	+20 44 1.81	+13.456	−0.082

o Ceti, var., 331^d, $1^m.7$–$9^m.6$, star 9^m f.8^s
ι Cassiop., triple, 7^m, 8^m, 2″, 8″
γ Ceti, comp. $6^m.2$, 2″.7 pr.

η Persei, star $8^m.5$, 28″ n. pr.
ε Arietis, dup., $5^m.2$, $5^m.6$, 1″.2
θ Eridani, comp. $4^m.4$, f.8″

ρ Persei, var. irreg., $3^m.4$–$4^m.2$
β Persei, var. $2^d.87$, $2^m.1$–$3^m.2$
12 Eridani, comp. 7^m, 1″.4 n. pr.

FOR JANUARY $0^{d}.975$, WASHINGTON MEAN TIME.

Name of Star.	Magnitude.	Spectrum.	Right Ascension.			Annual Variation.	Annual P. M.	Declination.			Annual Variation.	Annual P. M.
			h	m	s	s	s	°	′	″	″	″
38 G. Horologii . †	5.7	N	3	10	25.278	+1.5148	−.0005	−57	38	9.11	+13.509	−0.006
ζ Eridani . . .	4.9	A3	3	11	45.116	2.9124	−.0008	− 9	7	51.61	13.482	+0.053
τ Arietis . . .	5.2	B3	3	16	22.469	3.4595	+.0023	+20	50	41.90	13.093	−0.033
e Eridani . . .	4.3	G5	3	16	34.358	+2.3980	+.2808	−43	23	25.47	13.871	+0.757
ι Hydri . . .	5.5	F2	3	18	1.586	−1.5516	+.0352	−77	41	44.73	13.057	+0.040
α Persei . . .	1.9	F5	3	18	19.065	+4.2695	+.0030	+49	33	47.48	+12.969	−0.028
ο Tauri . . .	3.8	G5	3	20	17.438	3.2255	−.0046	+ 8	44	2.54	12.792	−0.074
2 H. Camelopardalis .	4.4	A0	3	22	15.401	4.8380	+.0027	+59	38	55.40	12.734	+0.001
ξ Tauri . . .	3.8	B8	3	22	36.879	3.2485	+.0040	+ 9	26	25.64	12.662	−0.046
f Tauri . . .	4.3	K0	3	26	13.995	3.3092	+.0016	+12	38	58.64	12.465	+0.002
ε Eridani . . . †	3.8	K0p	3	28	58.316	+2.8253	−.0660	− 9	44	30.51	+12.300	+0.026
τ^3 Eridani . . .	4.3	B8	3	30	4.554	2.6483	+.0023	−21	54	50.59	12.159	−0.039
δ Persei . . .	3.1	B5	3	36	56.244	4.2604	+.0035	+47	31	11.99	11.680	−0.036
δ Eridani . . .	3.7	K0	3	39	13.421	2.8730	−.0061	−10	2	49.84	12.284	+0.731
ν Persei . . .	3.9	F5	3	39	28.910	4.0672	−.0004	+42	18	51.41	11.535	0.000
5 H. Camelopardalis .	4.7	A0	3	41	28.175	+6.2856	+.0059	+71	4	29.21	+11.335	−0.057
η Tauri (*Alcyone*) . †	3.0	B5	3	42	29.281	3.5618	+.0016	+23	50	46.45	11.269	−0.050
τ^6 Eridani . . .	4.3	F8	3	43	14.014	2.5806	−.0115	−23	29	47.47	10.783	−0.481
g Eridani . . .	4.2	K0	3	46	18.679	+2.2451	−.0036	−36	27	13.90	11.013	−0.028
γ Hydri . . .	3.2	Ma	3	48	31.478	−0.9642	+.0096	−74	29	47.94	10.996	+0.117
ζ Persei . . .	2.9	B1	3	48	50.870	+3.7658	+.0010	+31	38	6.39	+10.841	−0.014
9 H. Camelopardalis . †	5.2	K0p	3	49	57.839	5.0947	+.0003	+60	51	50.38	10.756	−0.017
ε Persei . . . †	3.0	B0	3	52	12.766	4.0195	+.0031	+39	46	5.65	10.580	−0.027
ξ Persei . . .	4.0	Oe5	3	53	30.643	3.8871	+.0012	+35	33	1.17	10.493	−0.017
γ Eridani . . .	3.2	K5	3	54	6.591	2.7985	+.0047	−13	44	48.28	10.355	−0.110
λ Tauri . . . †	*var.*	B3	3	56	1.481	+3.3216	+.0002	+12	15	13.87	+10.311	−0.011
δ Reticuli . . .	4.4	Ma	3	57	24.627	0.9410	−.0020	−61	38	12.59	10.216	−0.002
ν Tauri . . .	3.9	A0	3	58	41.191	3.1897	+.0008	+ 5	45	25.40	10.117	−0.005
A Tauri . . . †	4.5	K0	3	59	43.595	3.5434	+.0069	+21	51	11.97	9.985	−0.058
c Persei . . .	4.0	B3p	4	2	33.497	4.3474	+.0042	+47	29	21.59	9.796	−0.032
p Tauri . . .	5.6	F0	4	5	42.728	+3.6494	−.0024	+26	15	45.53	+ 9.545	−0.042
o^1 Eridani . . .	4.1	F5	4	7	45.861	2.9274	+.0007	− 7	3	20.77	9.515	+0.086
μ Tauri . . .	4.3	B3	4	10	58.288	3.2557	+.0016	+ 8	40	58.24	9.156	−0.024
α Horologii . . .	3.8	K0	4	11	13.084	1.9874	+.0040	−42	30	4.63	8.931	−0.230
α Reticuli . . .	3.4	G5	4	13	20.306	0.7652	+.0048	−62	41	2.04	9.040	+0.044
γ Tauri . . .	3.9	K0	4	15	0.665	+3.4117	+.0083	+15	25	32.48	+ 8.839	−0.026
δ Tauri . . .	3.9	K0	4	18	5.298	3.4570	+.0075	+17	20	47.12	8.592	−0.030
υ^5 Eridani . . .	4.1	K5	4	20	52.886	+2.2529	+.0052	−34	12	41.02	8.444	+0.042
δ Mensæ . . .	5.6	K0	4	23	37.125	−4.1448	+.0042	−80	24	42.07	8.255	+0.072
ε Tauri . . .	3.6	K0	4	23	42.585	+3.5008	+.0082	+18	59	42.29	8.142	−0.034
m Persei . . . †	6.1	F0	4	27	30.041	+4.2153	+.0012	+42	53	8.12	+ 7.876	+0.004
α Tauri (*Aldebaran*) .	1.1	K5	4	31	5.918	3.4401	+.0047	+16	20	28.92	7.393	−0.189
ν Eridani . . .	4.1	B2	4	32	7.236	2.9958	−.0005	− 3	31	23.92	7.499	0.000
α Doradus . . .	3.5	A0p	4	32	10.814	1.2948	+.0067	−55	13	6.35	7.484	−0.011
53 Eridani . . .	4.0	K0	4	34	19.901	2.7456	−.0061	−14	28	2.58	7.166	−0.154
τ Tauri . . .	4.3	B5	4	37	12.093	+3.5987	+.0007	+22	47	48.28	+ 7.066	−0.020
Groombridge 848 .	6.0	F0	4	37	30.341	8.0214	+.0095	+75	47	25.25	6.916	−0.144
α Cœli	4.5	F2	4	37	51.195	1.9300	−.0149	−42	1	26.21	6.925	−0.106
4 Camelopardalis . .	5.4	A2	4	41	0.023	4.9870	+.0062	+56	36	33.72	6.625	−0.148
μ Eridani . . .	4.2	B5	4	41	18.093	2.9988	+.0011	− 3	24	27.84	6.740	−0.009
π^3 Orionis . . .	3.3	F8	4	45	16.727	+3.2552	+.0312	+ 6	48	56.31	+ 6.444	+0.023
9 Camelopardalis . .	4.4	B0	4	45	41.488	5.9488	+.0038	+66	12	5.88	6.391	+0.005
i Tauri . . .	5.1	F0	4	46	27.503	3.5077	+.0059	+18	41	52.33	6.288	−0.035
π^5 Orionis . . .	3.9	B3	4	49	52.504	3.1241	+.0002	+ 2	18	14.77	6.043	+0.005
ι Aurigæ . . .	2.9	K2	4	51	31.252	3.9040	+.0009	+33	2	3.02	5.879	−0.021
ε Aurigæ . . . †	*var.*	F5p	4	55	56.319	+4.3014	+.0012	+43	42	0.60	+ 5.517	−0.013
β Camelopardalis . .	4.2	G0	4	55	56.349	+5.3260	−.0004	+60	19	15.57	+ 5.519	−0.011

38 Horologii, remarkable purplish red star.
ε Eridani, comp. 9^m, s. 7″

η Tauri, quad., comps. $6^m.3$, $7^m.6$, $8^m.2$, 117″, 181″, 190″
9 H. Camelop., comp. 8^m, 1″.9 n. f.
ε Persei, comp. 8^m, 8″.6 n. f.

λ Tauri, var., $3^d.95$, $3^m.3$–$4^m.2$
A Tauri, star $6^m.5$ f. 38^s, 270″ s.
m Persei, star 6^m, 115″ s. pr.
ε Aurigæ, var. irreg., $3^m.0$–$4^m.5$.

MEAN PLACES OF TEN-DAY STARS, 1916.

FOR JANUARY 0^{d}.975, WASHINGTON MEAN TIME.

Name of Star.	Magnitude.	Spectrum.	Right Ascension.	Annual Variation.	Annual P. M.	Declination.	Annual Variation.	Annual P. M.
			h m s	s	s	° ′ ″	″	″
ζ Aurigæ	3.9	K0p	4 56 36.212	+ 4.1897	+.0013	+40 57 15.99	+5.453	−0.022
ι Tauri	4.7	A5	4 58 4.422	3.5848	+.0056	+21 28 15.14	5.301	−0.049
11 Orionis	4.6	B9	4 59 46.076	3.4267	+.0013	+15 17 17.13	5.172	−0.036
η Aurigæ	3.3	B3	5 0 37.321	4.2043	+.0039	+41 7 19.26	5.064	−0.071
ε Leporis	3.3	K5	5 1 54.273	2.5385	+.0012	−22 28 59.19	4.963	−0.064
β Eridani	2.9	A2	5 3 43.198	+ 2.9492	−.0056	− 5 11 38.82	+4.799	−0.074
μ Aurigæ	4.8	A3	5 7 40.639	4.1018	−.0020	+38 23 10.05	4.457	−0.080
19 H. Camelopardalis	5.2	F8	5 8 41.347	9.8354	−.0281	+79 8 14.63	4.606	+0.155
μ Leporis	3.3	A0p	5 9 9.467	2.6940	+.0027	−16 18 14.84	4.383	−0.028
α Aurigæ (*Capella*)	0.2	G0	5 10 28.877	4.4288	+.0086	+45 54 49.80	3.869	−0.429
β Orionis (*Rigel*) †	0.3	B8p	5 10 30.009	+ 2.8823	.0000	− 8 17 52.14	+4.296	0.000
λ Aurigæ	4.8	G0	5 13 13.803	4.2178	+.0461	+40 1 32.22	3.403	−0.659
τ Orionis	3.7	B5	5 13 31.639	2.9125	−.0009	− 6 56 3.50	4.032	−0.005
o Columbæ	4.9	K0	5 14 27.134	2.1588	+.0027	−34 58 36.96	3.606	−0.352
γ Orionis (*Bellatrix*)	1.7	B2	5 20 37.494	3.2170	−.0004	+ 6 16 28.16	3.410	−0.017
β Tauri	1.8	B8	5 20 58.844	+ 3.7914	+.0025	+28 32 15.30	+3.220	−0.177
17 Camelopardalis	5.8	K5	5 22 13.983	5.6600	+.0003	+62 59 54.93	3.281	−0.007
β Leporis	3.0	G0	5 24 38.769	2.5703	.0000	−20 49 32.17	2.991	−0.089
χ Aurigæ	4.9	B1	5 27 15.567	3.9040	+.0006	+32 7 51.48	2.841	−0.013
δ Orionis †	2.5	B0	5 27 42.873	3.0643	.0000	− 0 21 37.50	2.812	−0.002
Groombridge 966	6.4	K5	5 28 29.055	+ 8.0094	−.0002	+74 59 25.67	+2.765	+0.017
α Leporis	2.7	F0	5 29 1.511	2.6457	+.0003	−17 52 53.95	2.701	0.000
ϕ^{1} Orionis	4.5	B0	5 30 12.485	3.2926	−.0002	+ 9 26 0.76	2.583	−0.015
ι Orionis †	2.9	Oe5	5 31 19.425	2.9342	+.0001	− 5 57 51.16	2.499	−0.002
ε Orionis	1.8	B0	5 31 57.032	3.0436	.0000	− 1 15 16.65	2.448	+0.001
ζ Tauri	3.0	B3	5 32 37.435	+ 3.5850	+.0006	+21 5 32.05	+2.357	−0.032
ζ Orionis †	2.0	B0	5 36 31.200	3.0270	+.0005	− 1 59 10.51	2.036	−0.014
α Columbæ	2.8	B5p	5 36 36.437	2.1725	+.0006	−34 7 6.00	2.004	−0.038
o Aurigæ	5.5	A0	5 39 23.462	4.6453	−.0018	+49 47 26.62	1.782	−0.018
ζ Leporis	3.7	A2	5 43 8.926	2.7179	−.0013	−14 51 8.79	1.472	−0.001
κ Orionis	2.2	B0	5 43 46.341	+ 2.8449	+.0001	− 9 41 55.07	+1.415	−0.003
δ Doradus	4.5	A5	5 44 37.210	0.1022	−.0081	−65 46 1.35	1.343	−0.001
ν Aurigæ	4.2	K0	5 45 40.041	4.1574	−.0001	+39 7 30.42	1.266	+0.013
δ Leporis	3.9	K0	5 47 42.504	2.5796	+.0162	−20 53 7.54	0.426	−0.649
α Orionis (*Betelgeux*) †	*var.*	Ma	5 50 37.435	3.2479	+.0020	+ 7 23 32.49	0.829	+0.009
η Leporis	3.8	F5	5 52 34.729	+ 2.7323	−.0028	−14 10 56.06	+0.790	+0.141
δ Aurigæ	3.9	K0	5 52 36.694	4.9419	+.0118	+54 16 47.15	0.528	−0.118
β Aurigæ	2.1	A0p	5 53 22.062	4.4018	−.0038	+44 56 24.64	0.574	−0.006
θ Aurigæ †	2.7	A0p	5 53 59.593	4.0917	+.0047	+37 12 28.13	+0.435	−0.091
1 Geminorum	4.3	G5	5 59 0.858	3.6475	+.0002	+23 16 7.86	−0.023	−0.109
1 G. Puppis †	6.2	F8	6 2 3.356	+ 1.7258	−.0088	−45 2 9.85	+0.045	+0.225
ν Orionis	4.4	B2	6 2 46.584	3.4264	+.0012	+14 46 46.06	−0.268	−0.025
22 H. Camelopardalis	4.7	A0	6 9 35.607	6.6183	+.0026	+69 21 4.42	0.953	−0.114
η Geminorum †	*var.*	Ma	6 9 48.476	3.6227	−.0039	+22 31 55.79	0.874	−0.016
2 Lyncis	4.4	A0	6 12 12.906	5.2985	+.0012	+59 2 34.56	1.038	+0.030
ζ Canis Majoris	3.1	B3	6 17 5.227	+ 2.3018	−.0006	−30 1 32.51	−1.517	−0.023
μ Geminorum	3.2	Ma	6 17 52.755	3.6307	+.0046	+22 33 27.98	1.677	−0.114
ψ^{1} Aurigæ	5.1	K2	6 18 25.912	4.6259	+.0029	+49 19 55.64	1.614	−0.004
β Canis Majoris	2.0	B1	6 19 0.013	2.6416	−.0006	−17 54 48.02	1.656	+0.004
8 Monocerotis †	4.5	A5	6 19 19.045	3.1802	−.0004	+ 4 38 11.22	1.679	+0.009
α Argus (*Canopus*)	−0.9	F0	6 22 5.233	+ 1.3319	+.0022	−52 38 58.12	−1.920	+0.009
10 Monocerotis	5.0	B3	6 23 48.754	2.9641	+.0010	− 4 42 33.46	2.073	+0.006
ν Geminorum	4.1	B5	6 23 58.542	3.5629	−.0005	+20 15 58.87	2.109	−0.016
8 Lyncis	6.0	G0	6 30 1.113	5.4919	−.0267	+61 33 23.74	2.894	−0.276
ξ^{2} Canis Majoris	4.5	A0	6 31 32.170	2.5157	+.0022	−22 53 49.14	2.715	+0.035
23 H. Camelopardalis	5.6	F8	6 31 55.274	+10.2973	−.0277	+79 39 29.35	−3.416	−0.633
51 Aurigæ	5.7	K0	6 32 50.375	+ 4.1596	−.0020	+39 27 57.77	−2.975	−0.113

β Orionis, comp. 8^{m}.0, 9″.5 s. pr.
δ Orionis, star 6^{m}.9, 52″.6 n.
ι Orionis, comp. 7^{m}.3, 11″.5 s. f.

ζ Orionis, comp. 4^{m}.2, 2″.4 s. f.
α Orionis, red star, var. irreg. 1^{m}.0–1^{m}.4.
θ Aurigæ, comp. 7^{m}.5, 2″.5, n. pr.

1 Puppis, star, 5^{m}.8, 150″ s. f.
η Gem., var. 231^{d}.4, 3^{m}.2–4^{m}.2, comp. 8^{m}.8, 1″.2 n. pr.
8 Monoc., star 6^{m}.5, 13″.7 n. f.

FOR JANUARY $0^d.975$, WASHINGTON MEAN TIME.

Name of Star.	Magnitude.	Spectrum.	Right Ascension.	Annual Variation.	Annual P. M.	Declination.	Annual Variation.	Annual P. M.
			h m s	s	s	° ′ ″	″	″
γ Geminorum	1.9	A0	6 32 51.596	+3.4670	+.0033	+16 28 18.98	− 2.912	−0.048
ν Argus	3.2	B8	6 35 11.546	1.8367	+.0008	−43 7 18.49	3.085	−0.019
8 Monocerotis †	4.7	Oe5	6 36 21.140	3.3047	.0000	+ 9 58 27.69	3.174	−0.008
ε Geminorum	3.2	G5	6 38 45.897	3.6928	−.0001	+25 12 55.35	3.392	−0.018
ξ Geminorum	3.4	F5	6 40 34.528	3.3684	−.0076	+12 59 13.76	3.723	−0.193
ψ^5 Aurigæ	5.3	G0	6 40 41.291	+4.3297	+.0018	+43 39 44.08	− 3.380	+0.160
α Canis Majoris (*Sirius*) †	−1.6	A0	6 41 26.790	2.6434	−.0373	−16 36 0.58	4.812	−1.207
18 Monocerotis	4.7	K0	6 43 28.835	3.1281	−.0020	+ 2 30 18.00	3.796	−0.016
43 Camelopardalis	5.1	B5	6 44 39.362	6.4880	+.0021	+68 59 16.09	3.869	+0.012
θ Geminorum	3.6	A2	6 47 15.287	3.9581	+.0010	+34 3 49.17	4.154	−0.050
α Pictoris	3.3	A5	6 47 19.858	+0.6176	−.0105	−61 51 4.03	− 3.873	+0.238
τ Argus	2.8	K0	6 47 51.096	1.4883	+.0025	−50 30 52.06	4.262	−0.107
15 Lyncis †	4.5	K0	6 50 0.597	5.2067	+.0021	+58 32 3.62	4.469	−0.130
θ Canis Majoris	4.2	K2	6 50 17.260	2.7879	−.0091	−11 55 56.87	4.370	−0.007
ε Canis Majoris †	1.6	B1	6 55 19.459	2.3574	−.0001	−28 51 25.31	4.789	+0.003
ζ Geminorum †	*var.*	G0	6 59 7.687	+3.5606	−.0002	+20 41 40.18	− 5.122	−0.007
o^2 Canis Majoris	3.1	B5p	6 59 31.015	2.5048	−.0006	−23 42 35.14	5.142	+0.005
γ Canis Majoris	4.1	B5	6 59 57.505	2.7148	+.0003	−15 30 30.09	5.194	−0.010
δ Canis Majoris	2.0	F8	7 4 58.493	2.4381	−.0015	−26 15 32.77	5.604	+0.003
63 Aurigæ	5.1	K2	7 5 52.857	4.1327	+.0052	+39 27 31.38	5.686	−0.003
51 Geminorum	5.3	Mb	7 8 32.969	+3.4480	+.0019	+16 18 8.93	− 5.948	−0.042
γ^2 Volantis †	3.9	K0	7 9 27.782	−0.5015	+.0004	−70 21 45.79	5.905	+0.078
λ Geminorum	3.6	A2	7 13 16.021	+3.4502	−.0029	+16 41 34.15	6.345	−0.045
π Argus	2.7	K5	7 14 10.561	2.1189	−.0008	−36 56 46.56	6.385	−0.010
δ Geminorum †	3.5	F0	7 15 6.499	+3.5864	−.0010	+22 8 16.82	6.467	−0.015
δ Volantis	4.0	F5	7 16 52.978	−0.0196	+.0004	−67 48 12.73	− 6.605	−0.006
ι Geminorum	3.9	K0	7 20 30.708	+3.7303	−.0086	+27 57 57.79	6.986	−0.088
η Canis Majoris	2.4	B5p	7 20 46.397	2.3738	+.0003	−29 8 18.70	6.912	+0.007
Groombridge 1308	5.8	K0	7 22 9.238	6.2741	+.0018	+68 38 19.97	7.078	−0.045
β Canis Minoris	3.1	B8	7 22 35.794	3.2554	−.0032	+ 8 27 34.04	7.116	−0.047
ρ Geminorum	4.2	F0	7 23 42.652	+3.8630	+.0118	+31 57 9.91	− 6.977	+0.183
σ Argus †	3.3	K5	7 26 33.898	1.9016	−.0072	−43 7 50.87	7.212	+0.180
α^2 Geminorum (*Castor*)	2.0	A0	7 29 14.569	3.8330	−.0144	+32 4 26.76	7.692	−0.082
α^1 Geminorum	2.8	A0	$\Delta\alpha$ − 0.259	. . . .	. . .	$\Delta\delta$ − 4.13	. . . .	. . .
25 Monocerotis	5.2	F5	7 33 6.082	2.9819	−.0066	− 3 55 21.06	7.899	+0.022
α Can. Min. (*Procyon*) †	0.5	F5	7 34 54.334	+3.1420	−.0471	+ 5 26 27.47	− 9.103	−1.037
24 Lyncis	5.0	A2	7 35 54.485	5.0932	−.0042	+58 54 29.69	8.202	−0.056
κ Geminorum †	3.7	G5	7 39 22.749	3.6264	−.0014	+24 36 1.18	8.482	−0.060
β Geminorum (*Pollux*)	1.2	K0	7 40 10.693	3.6756	−.0470	+28 13 48.17	8.541	−0.055
4 Puppis	5.1	F2	7 42 4.799	2.7636	−.0003	−14 21 31.95	8.638	−0.002
ξ Argus	3.5	G0	7 45 45.688	+2.5232	−.0004	−24 38 53.64	− 8.925	0.000
φ Geminorum	5.0	A2	7 48 21.559	3.6765	−.0020	+26 59 3.30	9.155	−0.027
26 Lyncis	5.7	K0	7 48 36.153	4.3811	−.0022	+47 47 0.54	9.153	−0.006
Groombridge 1374	5.6	K0	7 50 10.049	7.2422	−.0023	+74 8 38.80	9.306	−0.037
χ Argus	3.6	B3	7 54 38.618	1.5259	−.0043	−52 45 24.32	9.609	+0.006
ω Cancri	5.9	K0	7 55 51.041	+3.6338	+.0003	+25 37 25.16	− 9.711	−0.004
χ Geminorum	5.0	K0	7 58 21.749	3.6902	−.0012	+28 1 50.57	9.951	−0.053
27 Lyncis	4.9	A2	8 2 8.868	4.5295	−.0032	+51 44 59.99	10.188	−0.003
ρ Argus	2.9	F5	8 3 57.982	2.5546	−.0065	−24 3 40.92	10.269	+0.052
3 H. Ursæ Majoris	5.5	G5	8 4 28.232	6.0107	+.0002	+68 43 22.22	10.355	+0.005
γ Argus †	2.2	Oap	8 6 56.697	+1.8498	−.0003	−47 5 19.21	−10.555	−0.011
ζ Cancri (*mean*) †	4.7	G0	8 7 23.797	3.4441	+.0051	+17 54 7.45	10.706	−0.129
Bradley 1147	5.7	G5	8 9 1.463	7.6181	+.0077	+76 0 53.87	10.706	−0.008
20 Puppis	5.0	G5	8 9 28.314	2.7580	−.0009	−15 32 3.85	10.731	+0.001
β Cancri	3.8	K2	8 11 57.660	3.2556	−.0035	+ 9 26 42.90	10.967	−0.052
31 Lyncis	4.4	K5	8 17 5.535	+4.1205	+.0015	+43 27 31.09	−11.388	−0.100
d^1 Cancri	5.9	F0	8 18 33.377	+3.4390	−.0038	+18 36 9.73	−11.425	−0.031

8 Monoc., comp. $8^m.8$, $2''.9$ s. pr.
15 Lyncis, dup., $4^m.9$, $6^m.2$, $0''.7$.
ε Can. Maj., comp. 9^m, $7''.8$ s. f.
ζ Gem., var., $10^d.15$, $3^m.7$–$4^m.3$.

γ^2 Volantis, comp. $5^m.8$, $12''.9$ n. pr.
δ Gem., comp. 8^m, $7''.0$ s. pr.
σ Argus, star 8^m, $22''.4$ n. f.
κ Gem., comp. $8^m.5$, $6''.6$ s. pr.

γ Argus, star 5^m, $42''.5$ s. pr.
ζ Cancri, triple; binary $5^m.6$, $6^m.3$, $1''$ with comp. $6^m.0$, $5''.4$ s. f.

Positions given for Sirius and *Procyon are those of the centers of their orbits. Corrections given on page xii are to be applied to reduce to the positions of the stars.*

FOR JANUARY $0^{d}.975$, WASHINGTON MEAN TIME.

Name of Star.	Magnitude.	Spectrum.	Right Ascension.	Annual Variation.	Annual P. M.	Declination.	Annual Variation.	Annual P. M.
			h m s	s	s	° ′ ″	″	″
ε Argus	1.7	K0p	8 20 47.481	+1.2337	−.0042	−59 14 20.02	−11.547	+0.008
30 Monocerotis	4.0	A0	8 21 27.868	+2.9996	−.0039	− 3 37 53.80	11.622	−0.020
θ Chamæleontis	4.3	K0	8 23 10.871	−1.7489	−.0451	−77 12 50.51	11.707	+0.017
ο Ursæ Majoris	3.5	G0	8 23 17.919	+5.0114	−.0160	+61 0 0.62	11.845	−0.112
Groombridge 1450	6.0	K0	8 27 27.627	3.9090	−.0082	+38 18 19.40	12.205	−0.179
η Cancri	5.5	B5p	8 27 51.235	+3.4742	−.0025	+20 43 38.24	−12.108	−0.055
Groombridge 1446	6.3	K0	8 30 23.950	6.7426	−.0043	+73 55 28.86	12.348	−0.117
δ Hydræ	4.2	A0	8 33 12.642	3.1781	−.0048	+ 5 59 50.75	12.439	−0.014
σ Hydræ	4.5	K0	8 34 22.106	3.1382	−.0008	+ 3 38 13.72	12.516	−0.013
γ Cancri	4.7	A0	8 38 25.678	3.4767	−.0071	+21 46 16.99	12.822	−0.043
δ Cancri	4.2	K0	8 39 54.842	+3.4137	−.0009	+18 27 49.59	−13.119	−0.240
α Pyxidis	3.7	B2	8 40 12.973	2.4110	−.0003	−32 52 58.79	12.889	+0.011
ι Cancri †	4.2	G5	8 41 37.098	3.6377	−.0006	+29 4 4.64	13.044	−0.051
ε Hydræ †	3.5	F8	8 42 19.761	3.1797	−.0127	+ 6 43 40.04	13.089	−0.048
δ Argus †	2.0	A0	8 42 22.850	1.6517	−.0035	−54 24 1.33	13.144	−0.100
σ² Cancri (*mean*) †	5.5	K0	8 49 7.423	+3.6678	+.0034	+30 53 54.01	−13.507	−0.021
ζ Hydræ	3.3	K0	8 50 57.329	3.1744	−.0060	+ 6 15 57.40	13.597	+0.007
ι Ursæ Majoris	3.1	A5	8 53 27.836	4.1223	−.0435	+48 22 20.25	14.013	−0.249
α Cancri	4.3	A3	8 53 53.709	3.2844	+.0024	+12 11 0.76	13.833	−0.042
b¹ Carinæ †	5.1	B3	8 54 55.031	1.4681	−.0034	−58 54 17.78	13.875	−0.019
κ Ursæ Majoris	3.7	A0	8 57 53.888	+4.1102	−.0027	+47 29 22.42	−14.110	−0.067
σ² Ursæ Majoris †	4.9	F8	9 3 1.322	5.3208	−.0003	+67 28 35.96	14.426	−0.066
κ Cancri	5.1	B8	9 3 11.972	3.2526	−.0012	+11 0 24.87	14.384	−0.013
λ Argus	2.2	K5	9 4 54.344	2.2062	−.0015	−43 5 35.32	14.481	−0.007
θ Hydræ	3.8	A0	9 9 59.736	3.1235	+.0088	+ 2 40 9.65	15.091	−0.312
β Argus	1.8	A0	9 12 16.995	+0.6696	−.0310	−69 22 16.01	−14.820	+0.094
83 Cancri	6.6	F5	9 14 17.778	3.3535	−.0076	+18 3 43.50	15.167	−0.136
ι Argus	2.2	F0	9 14 50.386	1.6040	−.0055	−58 55 20.51	15.055	+0.006
40 Lyncis	3.3	K5	9 15 56.542	3.6632	−.0178	+34 44 54.51	15.113	+0.012
θ Pyxidis	4.9	Ma	9 17 46.232	2.6514	−.0048	−25 36 28.15	15.262	−0.032
α Hydræ	2.2	K2	9 23 27.602	+2.9486	−.0010	− 8 17 37.92	−15.516	+0.033
h Ursæ Majoris	3.8	F0	9 24 55.424	4.7642	+.0183	+63 25 47.95	15.605	+0.024
d Ursæ Majoris	4.6	G0	9 27 4.820	5.3585	−.0112	+70 12 1.73	15.675	+0.071
θ Ursæ Majoris	3.3	F8	9 27 14.885	4.0298	−.1026	+52 3 39.40	16.298	−0.543
ψ Argus †	3.6	F5	9 27 23.322	2.3594	−.0181	−40 5 55.75	15.725	+0.038
ξ Leonis	5.1	G5	9 27 25.210	+3.2368	−.0063	+11 40 20.74	−15.848	−0.084
10 Leonis Minoris	4.6	G5	9 29 4.967	3.6849	+.0011	+36 46 16.43	15.875	−0.021
ο Leonis	3.8	F5p	9 36 40.165	3.2049	−.0096	+10 16 30.54	16.285	−0.033
θ Antliæ	5.0	F5	9 40 27.407	2.6731	−.0036	−27 23 3.84	16.414	+0.029
ε Leonis	3.1	G0p	9 41 5.182	3.4108	−.0034	+24 9 41.52	16.497	−0.022
υ Argus †	3.2	F0	9 45 0.188	+1.5008	−.0025	−64 40 56.03	−16.683	−0.017
υ Ursæ Majoris	3.9	F0	9 45 1.743	4.2913	−.0382	+59 26 4.34	16.826	−0.157
6 Sextantis	6.0	A3	9 47 0.112	3.0245	+.0011	− 3 50 56.80	16.792	−0.028
μ Leonis	4.1	K0	9 47 59.338	3.4169	−.0171	+26 24 11.38	16.865	−0.054
Groombridge 1586	6.0	K0	9 50 54.168	5.4283	−.0197	+73 16 46.76	17.008	−0.060
19 Leonis Minoris	5.2	F5	9 52 32.714	+3.6847	−.0112	+41 27 22.69	−17.047	−0.022
φ Argus	3.7	B5	9 53 54.658	2.1017	−.0033	−54 10 4.00	17.108	−0.020
π Leonis	4.9	Ma	9 55 46.547	3.1721	−.0029	+ 8 26 51.90	17.199	−0.027
η Leonis	3.6	A0p	10 2 45.224	3.2726	−.0022	+17 10 22.03	17.483	−0.004
α Leonis (*Regulus*)	1.3	B8	10 3 54.023	3.1981	−.0169	+12 22 41.53	17.530	−0.002
λ Hydræ	3.8	K0	10 6 29.579	+2.9247	−.0137	−11 56 18.16	−17.724	−0.088
q Velorum	4.1	A2	10 11 12.373	2.5130	−.0153	−41 42 19.48	17.797	+0.032
32 Ursæ Majoris	5.7	A3	10 11 57.046	4.3922	−.0140	+65 31 40.72	17.871	−0.012
ζ Leonis	3.6	F0	10 12 1.296	3.3421	+.0014	+23 50 11.01	17.870	−0.009
λ Ursæ Majoris	3.5	A0	10 12 2.266	3.6307	−.0142	+43 20 3.86	17.900	−0.038
γ Leonis *pr.* †	2.6	K0	10 15 20.627	+3.3114	+.0212	+20 16 0.85	−18.143	−0.152
μ Ursæ Majoris	3.2	K5	10 17 19.861	+3.5855	−.0069	+41 55 20.79	−18.040	+0.027

ι Cancri, star $6^{m}.6$, $30''.6$ n. pr.
ε Hydræ, triple; binary $3^{m}.5$, $6^{m}.8$, $0''.2$, with comp. $7^{m}.8$, $3''.3$
δ *Argus*, comp. 5^{m}, $2''$ s.
σ² Cancri, dup. $5^{m}.9$, $6^{m}.4$, $1''.4$
b¹ Carinæ, comp. $7^{m}.2$, 5^{s} f.
σ² Urs. Maj., binary $4^{m}.9$, 8^{m}, $1''.3$
ψ Argus, dup. $3^{m}.8$, $6^{m}.0$, $0''.8$
υ Argus, comp. $6^{m}.0$, $4''.9$ s. f.
γ Leonis, comp. $3^{m}.8$, $3''.7$ s. f.

FOR JANUARY $0^d.975$, WASHINGTON MEAN TIME.

Name of Star.	Magnitude.	Spectrum.	Right Ascension.	Annual Variation.	Annual P. M.	Declination.	Annual Variation.	Annual P. M.
			h m s	s	s	° ′ ″	″	″
30 H. Ursæ Majoris	4.9	A0	10 18 5.802	+4.3608	−.0024	+65 59 30.34	−18.114	−0.018
μ Hydræ	4.1	K5	10 22 1.636	2.9006	−.0089	−16 24 25.35	18.321	−0.079
31 Leonis Minoris	4.4	K0	10 23 1.899	3.4788	−.0094	+37 8 16.80	18.390	−0.112
α Antliæ	4.4	K5	10 23 18.372	2.7425	−.0060	−30 38 24.24	18.311	−0.023
36 Ursæ Majoris	4.8	F5	10 25 15.712	3.8601	−.0208	+56 24 42.15	18.396	−0.039
9 H. Draconis	5.0	G5	10 27 59.569	+5.1818	−.0084	+76 8 46.50	−18.461	−0.009
ρ Leonis	3.8	B0p	10 28 23.397	3.1615	−.0004	+ 9 44 21.40	18.469	−0.003
33 Sextantis	6.4	K0	10 37 7.785	3.0519	−.0100	− 1 17 57.93	18.859	−0.110
41 Leonis Minoris	5.0	A2	10 38 51.109	3.2669	−.0084	+23 37 42.71	18.793	+0.009
θ Argus	3.0	B0	10 39 57.356	2.1326	−.0043	−63 57 16.84	18.862	−0.027
42 Leonis Minoris	5.4	B9	10 41 11.871	+3.3423	−.0024	+31 7 30.24	−18.914	−0.041
η Argus †	*var.*	Pec.	10 41 47.913	2.3210	−.0002	−59 14 33.68	18.899	−0.009
μ Argus †	2.8	G5	10 43 9.184	2.5738	+.0066	−48 58 34.92	19.010	−0.061
l Leonis	5.3	A0	10 44 50.630	3.1564	+.0001	+10 59 23.67	19.010	−0.033
δ^2 Chamæleontis †	4.6	B3	10 45 0.424	0.5931	−.0192	−80 5 49.65	18.986	−0.004
ν Hydræ	3.3	Ma	10 45 28.732	+2.9583	+.0061	−15 45 12.88	−18.784	+0.211
46 Leonis Minoris	3.9	K0	10 48 37.110	3.3633	+.0074	+34 40 5.07	19.364	−0.283
54 Leonis †	4.5	A0	10 51 4.066	3.2529	−.0060	+25 11 53.08	19.164	−0.018
ι Antliæ	4.7	K0	10 52 48.311	2.7962	+.0112	−36 41 9.55	19.328	−0.138
Groombridge 1706	6.3	G5	10 53 16.364	4.8857	−.0265	+78 13 13.78	19.237	−0.035
α Crateris	4.2	K0	10 55 40.816	+2.9207	−.0327	−17 51 5.11	−19.153	+0.108
d Leonis	5.0	K0	10 56 13.381	3.0992	+.0004	+ 4 4 7.38	19.297	−0.022
β Ursæ Majoris	2.4	A0	10 56 46.955	3.6400	+.0105	+56 49 58.62	19.262	+0.026
α Ursæ Majoris	2.0	K0	10 58 33.405	3.7278	−.0164	+62 12 17.10	19.400	−0.071
χ Leonis	4.7	F0	11 0 41.109	3.0961	−.0234	+ 7 47 25.80	19.418	−0.041
p^4 Leonis	5.7	K0	11 2 37.184	+3.0613	−.0253	+ 2 24 42.76	−19.501	−0.080
ψ Ursæ Majoris	3.2	K0	11 4 56.853	3.3848	−.0053	+44 57 16.31	19.503	−0.033
β Crateris	4.5	A2	11 7 31.477	2.9477	.0000	−22 22 1.77	19.629	−0.106
δ Leonis	2.6	A2	11 9 38.629	3.1951	+.0108	+20 59 2.71	19.704	−0.141
θ Leonis	3.4	A0	11 9 50.010	3.1504	−.0049	+15 53 19.97	19.652	−0.085
ν Ursæ Majoris	3.7	K0	11 13 56.750	+3.2478	−.0018	+33 33 10.36	−19.616	+0.026
δ Crateris	3.8	K0	11 15 8.378	2.9975	−.0068	−14 19 25.72	19.468	+0.195
σ Leonis	4.1	A0	11 16 48.365	3.0950	−.0062	+ 6 29 23.80	19.703	−0.013
π Centauri	4.3	B5	11 17 10.273	2.7264	−.0041	−54 1 49.95	19.710	−0.013
ι Leonis †	4.0	F5	11 19 32.763	3.1286	+.0103	+10 59 31.49	19.817	−0.083
τ Leonis	5.2	K0	11 23 37.070	+3.0857	+.0008	+ 3 19 8.48	−19.810	−0.016
λ Draconis	4.1	Ma	11 26 26.035	3.5953	−.0072	+69 47 41.40	19.852	−0.021
ξ Hydræ	3.7	G5	11 28 52.058	2.9464	−.0158	−31 23 34.10	19.915	−0.055
λ Centauri	3.3	B9	11 31 53.892	2.7506	−.0073	−62 33 17.95	19.922	−0.027
υ Leonis	4.5	K0	11 32 38.870	3.0716	.0000	− 0 21 35.47	19.864	+0.039
π Chamæleontis	5.7	F0	11 33 47.279	+2.4536	−.0323	−75 25 53.52	−19.937	−0.023
3 Draconis	5.5	K0	11 37 48.021	3.3723	−.0080	+67 12 35.51	19.917	+0.035
ζ Crateris	4.9	G5	11 40 30.191	3.0378	+.0018	−17 53 1.28	20.014	−0.041
χ Ursæ Majoris	3.8	K0	11 41 37.269	3.1797	−.0128	+48 14 42.70	19.961	+0.020
β Leonis (*Denebola*)	2.2	A2	11 44 46.591	3.0623	−.0341	+15 2 30.04	20.120	−0.118
β Virginis	3.8	F8	11 46 19.185	+3.1252	+.0494	+ 2 14 17.45	−20.284	−0.275
Groombridge 1830	6.5	G5	11 48 8.543	3.4674	+.3401	+38 19 17.90	25.802	−5.783
γ Ursæ Majoris	2.5	A0	11 49 25.184	3.1696	+.0115	+54 9 42.49	20.020	+0.004
π Virginis	4.6	A3	11 56 34.106	3.0742	−.0009	+ 7 4 57.80	20.075	−0.032
o Virginis	4.2	G5	12 0 55.851	3.0570	−.0148	+ 9 11 57.96	20.013	+0.032
δ Centauri	2.9	B3p	12 3 59.891	+3.0956	−.0050	−50 15 17.12	−20.072	−0.030
ε Corvi	3.2	K0	12 5 48.125	3.0813	−.0051	−22 9 9.56	20.036	+0.003
4 H. Draconis	5.1	A5	12 8 16.804	2.8465	+.0026	+78 4 58.72	20.013	+0.019
δ Crucis	3.1	B3	12 10 40.888	3.1755	+.0021	−58 16 55.26	20.062	−0.038
δ Ursæ Majoris	3.4	A2	12 11 16.633	2.9844	+.0150	+57 29 57.52	20.016	+0.005
γ Corvi	2.8	B8	12 11 29.023	+3.0818	−.0114	−17 4 31.83	−20.004	+0.017
2 Canum Venaticorum †	5.8	K5	12 11 55.340	+3.0158	+.0038	+41 7 39.33	−20.064	−0.046

η Argus, var., irreg., $1^m.6$–$6^m.6$
μ Argus, comp. 7^m, 2″.2 n. f.

δ^2 Cham., star $5^m.5$ pr. 32^s, 256″ n.
54 Leonis, comp. $6^m.3$, 6″.4 s. f.

ι Leonis, comp. $6^m.8$, 2″.6 n. f.
2 Can. Ven., star 8^m, 11″.6 s. pr.

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Name of Star.	Magnitude.	Spectrum.	Right Ascension.	Annual Variation.	Annual P. M.	Declination.	Annual Variation.
			h m s	s	s	° ′ ″	″
β Chamæleontis . .	4.4	B5	12 13 23.374	+3.4496	−.0188	−78 50 44.94	−19.994
η Virginis . . .	4.0	A0	12 15 36.498	3.0694	−.0036	− 0 12 0.28	20.026
α¹ Crucis . . .	1.6	B1	12 21 54.868	3.3127	−.0064	−62 38 1.43	19.993
α² Crucis . . .	2.1		$\Delta\alpha$ + 0.630	. . . .	. . .	$\Delta\delta$ − 1.89	. . . .
20 Comæ . . .	5.7	A2	12 25 30.199	3.0182	+.0036	+21 21 40.14	19.957
δ Corvi . . . †	3.1	A0	12 25 30.964	+3.1013	−.0140	−16 2 52.41	−20.070
γ Crucis . . . †	1.6	Mb	12 26 29.724	3.3040	−.0028	−56 38 34.07	20.172
8 Canum Venaticorum	4.3	G0	12 29 45.482	2.8562	−.0617	+41 48 49.41	19.597
κ Draconis . . .	3.9	B5p	12 29 54.348	2.5771	−.0112	+70 15 4.12	19.865
β Corvi . . .	2.8	G5	12 29 58.260	3.1456	−.0008	−22 55 56.47	19.936
24 Comæ *seq.* . . . †	5.2	K0	12 30 55.021	+3.0106	−.0007	+18 50 21.36	−19.850
α Muscæ . . .	2.9	B3	12 32 9.530	3.5426	−.0088	−68 40 22.30	19.877
χ Virginis . . .	4.8	K0	12 34 54.542	3.0938	−.0056	− 7 32 0.49	19.844
γ Centauri . . . †	2.4	A0	12 36 52.657	3.2951	−.0196	−48 29 55.28	19.806
γ Virginis (*mean*) . †	2.9	F0	12 37 24.250	3.0398	−.0365	− 0 59 19.84	19.775
ρ Virginis . . .	5.0	A0	12 37 38.011	+3.0372	+.0058	+10 41 53.77	−19.882
76 Ursæ Majoris . .	5.9	A0	12 37 54.021	2.6311	−.0065	+63 10 26.67	19.790
β Crucis . . .	1.5	B1	12 42 48.163	3.4830	−.0064	−59 13 47.41	19.730
31 Comæ . . .	5.1	G0	12 47 36.483	2.9239	−.0022	+27 59 51.16	19.639
n Centauri . . .	4.3	A5	12 48 46.748	3.3132	+.0060	−39 43 20.14	19.628
ε Ursæ Majoris (*Alioth*)	1.7	A0p	12 50 20.288	+2.6479	+.0138	+56 24 56.04	−19.576
δ Virginis . . .	3.7	Ma	12 51 22.287	3.0208	−.0318	+ 3 51 13.40	19.604
α Canum Venat. *seq.* . †	2.9	A0p	12 52 6.046	2.8104	−.0203	+38 46 18.47	19.481
δ Muscæ . . .	3.6	K2	12 56 28.181	4.0741	+.0496	−71 5 45.69	19.471
ε Virginis . . .	3.0	K0	12 57 59.727	2.9865	−.0186	+11 24 37.35	19.392
θ Virginis . . . †	4.4	A0	13 5 35.932	+3.1033	−.0029	− 5 5 26.99	−19.270
43 Comæ . . .	4.3	G0	13 7 57.316	2.8025	−.0599	+28 18 13.34	18.292
20 Canum Venaticorum	4.7	F0	13 13 46.752	2.6955	−.0094	+41 0 52.61	19.001
γ Hydræ . . .	3.3	G5	13 14 21.082	3.2557	+.0046	−22 43 43.15	19.052
ι Centauri . . .	2.9	A2	13 15 52.103	3.3620	−.0294	−36 16 10.35	19.054
ζ¹ Ursæ Maj. (*Mizar*) . †	2.4	A0p	13 20 32.827	+2.4220	+.0153	+55 21 49.53	−18.849
ζ² Ursæ Majoris . .	4.0	A0	$\Delta\alpha$ + 0.916	. . . .	. . .	$\Delta\delta$ −12.40	. . . .
α Virginis (*Spica*) .	1.2	B2	13 20 45.933	3.1572	−.0028	−10 43 23.35	18.846
Groombridge 2001 .	6.1	K5	13 23 59.391	1.5244	+.0012	+72 49 38.63	18.733
70 Virginis . . .	5.2	G5	13 24 19.293	2.9340	−.0168	+14 13 37.52	19.288
ζ Virginis . . .	3.4	A2	13 30 24.680	+3.0546	−.0195	− 0 10 0.30	−18.466
17 H. Canum Venaticorum	5.0	F0	13 31 2.891	2.6816	+.0073	+37 36 45.03	18.488
ε Centauri . . .	2.6	B1	13 34 33.348	3.7808	−.0039	−53 2 23.50	18.403
m Virginis . . .	5.2	Ma	13 37 12.055	3.1453	−.0073	− 8 16 46.32	18.237
τ Boötis . . .	4.5	F5	13 43 16.220	2.8508	−.0341	+17 52 29.81	18.018
η Ursæ Majoris (*Alkaid*)	1.9	B3	13 44 13.973	+2.3679	−.0118	+49 43 55.60	−18.030
89 Virginis . . .	5.1	K0	13 45 18.232	3.2542	−.0077	−17 42 58.11	18.007
ζ Centauri . . .	3.1	B2p	13 50 17.497	3.7261	−.0070	−46 52 31.56	17.833
η Boötis . . .	2.8	G0	13 50 41.111	2.8567	−.0044	+18 49 6.09	18.116
θ Apodis . . . †	*var.*	Mb	13 57 5.955	5.7429	−.0293	−76 23 31.31	17.514
11 Boötis . . .	6.1	A3	13 57 22.007	+2.7215	−.0060	+27 47 30.50	−17.469
τ Virginis . . .	4.3	A2	13 57 22.216	3.0514	+.0010	+ 1 57 2.06	17.503
β Centauri . . .	0.9	B1	13 57 53.025	4.2066	−.0033	−59 58 6.04	17.485
π Hydræ . . .	3.5	K0	14 1 35.034	3.4096	+.0031	−26 16 41.74	17.436
θ Centauri . . .	2.3	K0	14 1 43.998	3.5199	−.0437	−35 57 26.03	17.808
α Draconis . . .	3.6	A0	14 2 6.929	+1.6245	−.0071	+64 46 37.27	−17.255
d Boötis . . .	4.8	F5	14 6 34.127	2.7370	−.0014	+25 29 20.44	17.143
κ Virginis . . .	4.3	K0	14 8 24.758	+3.1969	+.0006	− 9 52 59.74	16.848
4 Ursæ Minoris . .	5.0	K0	14 9 9.331	−0.2801	−.0108	+77 56 31.80	16.920
ι Virginis . . .	4.2	F5	14 11 36.449	+3.1426	−.0013	− 5 36 0.56	17.258
α Boötis (*Arcturus*) .	0.2	K0	14 11 49.765	+2.7355	−.0780	+19 37 9.21	−18.823
λ Boötis . . .	4.3	A0	14 13 11.522	+2.2831	−.0172	+46 28 24.87	−16.604

δ Corvi, star 8^{m}, 24″.4 s. pr.
γ Crucis, star 6^{m}.6, 85″ n. f.
24 Comæ, star 6^{m}.7, 20″.6 pr.
γ Cent., dup., 3^{m}.1, 3^{m}.1, 1″.7

γ Virginis, binary, 3^{m}.7, 3^{m}.7, 6″.2, P=328°
α Can. Ven., star 5^{m}, 19″.8 s. pr.
θ Virginis, comp. 9^{m}, 7″.1 n. pr.

ζ¹ Urs. Maj., star Alcor 4^{m}.0, 222″ n.
θ Apodis, var. irreg., 5^{m}.5–6^{m}.6

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Name of Star.	Magnitude.	Spectrum.	Right Ascension.	Annual Variation.	Annual P. M.	Declination.	Annual Variation.	Annual P. M.
			h m s	s	s	° ′ ″	″	″
λ Virginis	4.6	A2	14 14 33.671	+3.2409	−.0024	−12 59 6.04	−16.668	+0.021
2 Libræ	6.3	K0	14 18 54.254	3.2238	−.0014	−11 19 51.36	16.542	−0.067
θ Boötis	4.1	F8	14 22 20.286	2.0433	−.0254	+52 14 18.90	16.707	−0.405
f Boötis	5.4	A5	14 22 32.913	2.7901	−.0052	+19 36 14.39	16.277	+0.015
φ Virginis †	5.0	K0	14 23 52.369	+3.0890	−.0090	− 1 51 6.92	16.228	−0.004
5 Ursæ Minoris	4.4	K2	14 27 41.140	−0.1616	+.0022	+76 4 10.14	−16.004	+0.021
ρ Boötis	3.8	K0	14 28 12.622	+2.5865	−.0073	+30 44 22.61	15.884	+0.114
γ Boötis	3.0	F0	14 28 41.783	2.4171	−.0091	+38 40 30.73	15.827	+0.145
η Centauri	2.6	B3p	14 30 10.026	3.7973	−.0032	−41 47 21.99	15.926	−0.032
σ Boötis	4.5	F0	14 31 1.423	2.6131	+.0150	+30 6 34.32	15.724	+0.125
α Centauri †	0.1	G0	14 33 52.996	+4.0554	−.4861	−60 29 21.74	−14.971	+0.723
33 Boötis	5.4	A0	14 35 42.735	2.2341	−.0056	+44 45 59.17	15.638	−0.043
α Apodis	3.8	K5	14 37 21.667	7.2994	−.0088	−78 41 21.95	15.527	−0.024
μ Virginis	4.0	F5	14 38 37.891	3.1587	+.0071	− 5 17 37.04	15.754	−0.322
ε Boötis †	2.7	K0p	14 41 19.114	2.6203	−.0035	+27 25 39.84	15.272	+0.009
109 Virginis	3.8	A0	14 42 0.055	+3.0312	−.0074	+ 2 14 46.45	−15.277	−0.035
8 Libræ	5.3	F5	14 46 2.248	3.3134	−.0073	−15 38 54.95	15.085	−0.074
α Libræ	2.9	A2	14 46 13.694	3.3139	−.0078	−15 41 36.13	15.076	−0.077
Groombridge 2164	5.7	K2	14 49 18.404	+1.5202	−.0165	+59 38 5.92	14.702	+0.118
β Ursæ Minoris	2.2	K5	14 50 56.263	−0.2036	−.0065	+74 29 55.53	14.721	+0.003
ξ^{2} Libræ	5.6	K0	14 52 12.430	+3.2506	−.0006	−11 4 16.88	−14.649	−0.001
Piazzi 221	5.8	A0	14 52 15.264	2.8298	−.0021	+14 47 6.49	14.656	−0.011
β Lupi	2.8	B2p	14 53 1.265	3.9135	−.0070	−42 47 47.39	14.662	−0.062
δ Libræ †	*var.*	A0	14 56 28.892	3.2014	−.0051	− 8 11 10.73	14.405	−0.015
β Boötis	3.6	G5	14 58 46.922	2.2600	−.0036	+40 43 16.74	14.289	−0.040
γ Scorpii	3.4	Ma	14 59 9.007	+3.5050	−.0056	−24 57 8.92	−14.274	−0.048
ψ Boötis	4.7	K0	15 0 50.764	2.5704	−.0133	+27 16 28.36	14.136	−0.014
c Boötis	5.0	F0	15 3 36.691	2.6347	+.0136	+25 11 44.23	14.134	−0.184
ζ Lupi	3.5	K0	15 6 14.526	4.2923	−.0126	−51 46 48.79	13.849	−0.066
ι Libræ	4.7	A0p	15 7 25.778	3.4143	−.0031	−19 28 28.82	13.761	−0.053
3 Serpentis	5.4	K0	15 11 0.727	+2.9800	−.0017	+ 5 15 1.88	−13.482	−0.005
γ Trianguli Australis	3.1	A0	15 11 2.806	5.5541	−.0137	−68 22 13.66	13.517	−0.042
δ Boötis	3.5	K0	15 12 6.987	2.4193	+.0075	+33 37 39.12	13.531	−0.125
β Libræ	2.7	B8	15 12 29.068	+3.2249	−.0066	− 9 4 25.32	13.406	−0.024
γ Ursæ Minoris	3.1	A2	15 20 51.174	−0.1150	−.0020	+72 7 58.30	12.815	+0.013
μ Boötis *pr.* †	4.5	F0	15 21 19.029	+2.2664	−.0121	+37 40 16.22	−12.715	+0.081
τ^{1} Serpentis	5.5	Ma	15 21 53.543	2.7800	−.0024	+15 43 21.54	12.782	−0.024
ι Draconis	3.5	K0	15 23 3.659	1.3335	+.0014	+59 15 35.64	12.669	+0.010
32 Libræ	5.9	K0	15 23 30.975	3.3789	+.0006	−16 25 28.01	12.602	−0.043
β Coronæ Borealis	3.7	Fp	15 24 21.949	2.4738	−.0130	+29 23 40.60	12.512	+0.078
ν^{1} Boötis	5.2	K5	15 27 54.726	+2.1552	+.0016	+41 7 7.70	−12.361	−0.014
γ Lupi (*mean*) †	3.0	B3	15 29 32.242	3.9872	−.0020	−40 53 7.75	12.284	−0.049
γ Libræ	4.0	K0	15 30 49.503	3.3525	+.0047	−14 30 36.17	12.139	+0.006
α Coronæ Borealis	2.3	A0	15 31 7.852	2.5395	+.0090	+26 59 48.03	12.224	−0.100
ζ Coronæ Borealis *seq.* †	5.1	B8	15 36 12.892	2.2596	−.0005	+36 54 28.51	11.779	−0.012
α Serpentis	2.8	K0	15 40 7.749	+2.9531	+.0089	+ 6 41 20.94	−11.446	+0.042
β Serpentis	3.7	A2	15 42 18.645	2.7685	+.0054	+15 41 2.06	11.387	−0.055
κ Serpentis	4.3	K5	15 44 57.464	2.6996	−.0035	+18 24 0.59	11.239	−0.099
μ Serpentis	3.6	A0	15 45 14.077	3.1285	−.0058	− 3 10 26.23	11.148	−0.028
12 H. Draconis	5.1	A2	15 45 22.961	0.9074	+.0047	+62 51 31.84	11.177	−0.068
ε Serpentis	3.8	A0	15 46 37.636	+2.9884	+.0081	+ 4 43 47.80	−10.948	+0.070
ζ Ursæ Minoris	4.3	A2	15 47 1.892	−2.2017	+.0082	+78 3 12.36	10.992	−0.004
β Trianguli Australis	3.0	F0	15 47 43.747	+5.2580	−.0200	−63 10 21.58	11.345	−0.408
λ Libræ	5.1	B3	15 48 27.273	3.4775	−.0017	−19 55 1.09	10.930	−0.046
γ Serpentis	3.9	F8	15 52 34.337	2.7698	+.0212	+15 56 6.11	11.869	−1.289
π Scorpii	3.0	B2p	15 53 46.018	+3.6239	−.0010	−25 52 23.56	−10.539	−0.048
ε Coronæ Borealis	4.2	K0	15 54 6.526	+2.4823	−.0066	+27 7 13.44	−10.533	−0.067

φ Virginis, comp. 9^{m}, 4″.5 s. f.
ε Boötis, comp. 5^{m}.1, 2″.8 n. pr.

δ Libræ, var., 2^{d}.33, 4^{m}.8–6^{m}.2
μ Boötis, star 6^{m}.7, 108″ s.

γ Lupi, binary 3^{m}.7, 3^{m}.9, 0″.4
ζ Cor. Bor., comp. 6^{m}.0, 6″.2 n. pr.

α Centauri, dup., 0^{m}.3, 1^{m}.7; companion s. pr. The position given is that of the center of gravity of the system. Corrections given on page xii remain to be applied to reduce to the position of α^{2} Centauri.

FOR JANUARY $0^d.975$, WASHINGTON MEAN TIME.

Name of Star.	Magnitude.	Spectrum.	Right Ascension.	Annual Variation.	Annual P. M.	Declination.	Annual Variation.	Annual P. M.
			h m s	s	s	° ′ ″	″	″
δ Scorpii	2.5	B1p	15 55 21.789	+3.5424	−.0011	−22 23 0.78	−10.406	−0.035
θ Draconis	4.1	F8	16 0 18.856	1.1218	−.0391	+58 47 21.45	9.660	+0.339
β Scorpii †	2.9	B1	16 0 32.956	3.4837	−.0011	−19 34 34.99	10.009	−0.028
κ Herculis †	5.3	G5	16 4 16.932	2.7051	−.0039	+17 16 11.16	9.720	−0.023
Groombridge 2320	5.4	A0	16 6 5.318	0.1532	−.0074	+68 1 52.50	9.506	+0.062
φ Herculis	4.3	A0	16 6 7.374	+1.8898	−.0017	+45 9 16.64	− 9.519	+0.036
δ¹ Apodis	4.8	Mb	16 7 44.863	8.8568	−.0050	−78 29 10.94	9.486	−0.056
δ Ophiuchi	3.0	Ma	16 9 56.514	3.1416	−.0031	− 3 28 43.81	9.405	−0.144
σ Coronæ Bor. *seq.* †	5.8	G0	16 11 31.942	+2.2459	−.0223	+34 4 15.60	9.208	−0.071
19 Ursæ Minoris	5.5	B8	16 13 12.164	−1.7471	+.0007	+76 5 22.09	8.999	+0.008
γ² Normæ	4.1	K0	16 13 32.721	+4.4724	−.0216	−49 57 2.23	− 9.043	−0.064
ε Ophiuchi	3.3	K0	16 13 52.498	3.1719	+.0054	− 4 29 18.92	8.917	+0.037
σ Scorpii †	3.1	B1	16 16 4.779	3.6417	−.0011	−25 23 32.01	8.820	−0.039
τ Herculis	3.9	B5	16 17 12.953	1.8032	+.0001	+46 30 46.11	8.662	+0.029
γ Herculis	3.8	F0	16 18 12.831	+2.6455	−.0034	+19 20 58.45	8.576	+0.037
η Ursæ Minoris	5.0	F0	16 19 56.530	−1.7893	−.0231	+75 56 57.77	− 8.224	+0.252
γ Apodis	3.9	K0	16 20 31.517	+9.1055	−.0409	−78 42 38.92	8.512	−0.063
ω Herculis	4.5	Ap	16 21 32.083	2.7619	−.0028	+14 13 33.19	8.409	−0.059
η Draconis †	2.9	G5	16 22 51.082	0.8080	−.0020	+61 42 14.65	8.187	+0.058
α Scorpii (*Antares*) †	1.2	Map	16 24 15.249	3.6743	−.0006	−26 14 47.60	8.161	−0.028
β Herculis	2.8	K0	16 26 36.454	+2.5775	−.0076	+21 40 18.47	− 7.969	−0.025
λ Ophiuchi †	3.8	A0	16 26 40.530	+3.0240	−.0022	+ 2 10 0.96	8.018	−0.079
A Draconis	5.0	B8p	16 28 8.454	−0.1293	−.0048	+68 56 59.63	7.785	+0.036
τ Scorpii	2.9	B0	16 30 39.012	+3.7298	−.0013	−28 2 33.99	7.652	−0.034
σ Herculis	4.2	A0	16 31 23.682	1.9335	−.0006	+42 36 34.34	7.532	+0.036
ζ Ophiuchi	2.7	B0	16 32 31.894	+3.3009	+.0007	−10 23 52.23	− 7.444	+0.022
24 Scorpii	5.0	K0	16 36 42.753	3.4666	−.0017	−17 34 49.68	7.129	−0.004
ζ Herculis †	3.0	G0	16 38 7.157	2.2614	−.0364	+31 45 15.50	6.620	+0.380
α Trianguli Australis	1.9	K2	16 39 45.431	6.3244	+.0028	−68 52 30.55	6.925	−0.049
η Herculis	3.6	K0	16 40 0.928	2.0558	+.0031	+39 4 52.71	6.948	−0.093
Groombridge 2377	4.9	F0	16 43 42.208	+1.1374	+.0046	+56 55 53.99	− 6.480	+0.062
ε Scorpii	2.4	K0	16 44 43.148	3.8799	−.0505	−34 8 30.98	6.731	−0.264
49 Herculis	6.4	A0	16 48 15.353	2.7302	+.0010	+15 6 51.28	6.187	−0.014
ε¹ Aræ	4.2	K2	16 52 52.977	4.7714	−.0011	−53 1 58.16	5.808	−0.017
κ Ophiuchi	3.4	K0	16 53 41.476	2.8383	−.0199	+ 9 30 17.13	5.730	−0.011
30 Ophiuchi	5.0	K0	16 56 37.836	+3.1630	−.0018	− 4 5 51.02	− 5.548	−0.076
ε Herculis	3.9	A0	16 57 4.510	2.2946	−.0036	+31 2 57.72	5.412	+0.028
d Herculis	5.3	A2	16 58 30.204	2.2121	−.0016	+33 41 20.81	5.323	−0.009
η Ophiuchi †	2.6	A0	17 5 33.513	3.4375	+.0017	−15 37 18.62	4.626	+0.091
η Scorpii	3.4	F2	17 6 8.027	4.2924	+.0023	−43 7 47.17	4.974	−0.306
ζ Draconis	3.2	B5	17 8 32.474	+0.1691	−.0021	+65 49 4.72	− 4.446	+0.018
α Herculis †	*var.*	Mb	17 10 48.996	2.7345	−.0008	+14 29 6.70	4.239	+0.029
δ Herculis †	3.2	A0	17 11 34.833	2.4632	−.0019	+24 56 14.97	4.362	−0.158
π Herculis	3.4	K2	17 12 7.227	2.0885	−.0025	+36 54 11.30	4.158	−0.001
θ Ophiuchi	3.4	B3	17 16 50.939	3.6818	−.0006	−24 55 0.35	3.788	−0.036
w Herculis	5.4	G0	17 17 30.923	+2.2430	+.0095	+32 34 30.02	− 4.741	−1.047
β Aræ	2.8	K2	17 18 18.843	4.9811	−.0004	−55 27 6.14	3.653	−0.027
b Ophiuchi	4.3	F0	17 21 14.287	3.6609	−.0009	−24 5 57.17	3.512	−0.137
σ Ophiuchi	4.4	K0	17 22 20.777	2.9757	+.0002	+ 4 12 45.16	3.271	+0.008
δ Aræ	3.8	B8	17 23 30.632	5.4060	−.0098	−60 36 55.76	3.298	−0.120
α Aræ	3.0	B3p	17 25 20.740	+4.6330	−.0036	−49 48 39.11	− 3.103	−0.063
λ Herculis	4.5	K0	17 27 20.598	2.4241	+.0016	+26 10 23.59	2.828	+0.018
λ Scorpii	1.7	B2	17 27 54.161	4.0710	−.0004	−37 2 36.78	2.826	−0.027
β Draconis	3.0	G0	17 28 32.038	1.3543	−.0017	+52 21 47.19	2.735	+0.009
α Ophiuchi	2.1	A5	17 31 2.073	2.7838	+.0080	+12 37 12.90	2.762	−0.225
ξ Serpentis	3.6	A5	17 32 46.509	+3.4330	−.0038	−15 20 47.56	− 2.436	−0.060
ι Herculis	3.8	B3	17 37 5.633	+1.6936	+.0003	+46 3 1.81	− 1.997	+0.003

β Scorpii, comp. 5^m.1, 13″.3 n. f.
κ Herculis, star 6^m.5, 29″.7 n. f.
σ Cor. Bor., comp. 6^m.7, 4″.6 s. pr.
σ Scorpii, star 8^m, 21″ pr.
η Draconis, comp. 8^m, 5″.4 s. f.

α Scorpii, comp. 7^m, 3″.2 pr.
λ Ophiuchi, comp. 6^m, 1″.2 n. f.
ζ Herculis, binary, 3^m.0, 6^m.0, 1″
η Oph., binary, 3^m.2, 3^m.7, 0″.5

α Herculis, var. irreg., 3^m.1–3^m.9, dup. comp. 6^m, 4″.6 s. f.
δ Herculis, binary, comp. 8^m, 12″ s. pr.

FOR JANUARY $0^{d}.975$, WASHINGTON MEAN TIME.

Name of Star.	Magnitude.	Spectrum.	Right Ascension.	Annual Variation.	Annual P. M.	Declination.	Annual Variation.	Annual P. M.
			h m s	s	s	° ′ ″	″	″
ω Draconis	4.9	F5	17 37 26.494	−0.3541	+.0014	+68 47 48.67	−1.652	+0.318
η Pavonis	3.6	K0	17 37 29.038	+5.8815	−.0028	−64 41 7.02	2.046	−0.080
β Ophiuchi	2.9	K0	17 39 19.350	2.9629	−.0026	+ 4 36 5.45	1.649	+0.158
ι^1 Scorpii	3.1	F5p	17 41 42.557	4.1948	+.0006	−40 5 44.12	1.606	−0.008
μ Herculis	3.5	G5	17 43 10.225	+2.3471	−.0238	+27 46 8.64	2.220	−0.749
ψ Draconis †	4.9	F5	17 43 25.732	−1.0740	+.0023	+72 11 25.40	−1.716	−0.268
γ Ophiuchi	3.7	A0	17 43 40.805	+3.0073	−.0016	+ 2 44 16.87	1.499	−0.073
89 Herculis	5.5	F2	17 52 1.889	2.4207	+.0013	+26 3 45.44	0.691	+0.006
ξ Draconis	3.9	K0	17 52 4.646	+1.0381	+.0131	+56 53 7.86	0.616	+0.077
35 Draconis	5.0	F5	17 53 12.489	−2.6900	+.0116	+76 58 29.06	0.351	+0.243
θ Herculis	4.0	K0	17 53 22.320	+2.0571	+.0006	+37 15 39.49	−0.575	+0.004
ν Ophiuchi	3.5	K0	17 54 24.092	3.3019	−.0006	− 9 45 51.32	0.609	−0.120
ξ Herculis	3.8	K0	17 54 30.046	2.3315	+.0072	+29 15 22.39	0.499	−0.018
γ Draconis	2.4	K5	17 54 39.325	1.3925	−.0006	+51 29 53.85	0.491	−0.024
67 Ophiuchi	3.9	B5p	17 56 26.297	3.0049	+.0008	+ 2 56 4.98	0.324	−0.013
θ Aræ	3.9	B1	18 0 5.496	+4.6699	−.0010	−50 5 54.75	−0.042	−0.050
γ Sagittarii	3.1	K0	18 0 24.630	3.8520	−.0055	−30 25 34.40	0.162	−0.198
70 Ophiuchi †	4.1	K0	18 1 12.528	3.0316	+.0177	+ 2 31 4.89	−1.016	−1.122
72 Ophiuchi	3.7	A2	18 3 22.004	2.8433	−.0045	+ 9 33 4.03	+0.381	+0.087
ο Herculis	3.8	A0	18 4 15.919	2.3394	−.0002	+28 45 0.57	0.375	+0.002
μ Sagittarii	4.0	B8p	18 8 44.356	+3.5870	−.0004	−21 4 54.61	+0.763	−0.002
η Sagittarii	3.2	Mb	18 11 56.636	4.0597	−.0109	−36 47 16.04	0.892	−0.152
Groombridge 2533	5.4	B5	18 13 1.984	1.8652	−.0006	+42 7 48.39	1.138	−0.001
36 Draconis	5.0	F5	18 13 24.805	0.3456	+.0535	+64 22 7.11	1.198	+0.026
δ Sagittarii	2.8	K0	18 15 36.982	3.8406	+.0023	−29 51 53.67	1.331	−0.034
η Serpentis	3.4	K0	18 16 57.745	+3.1028	−.0378	− 2 55 17.24	+0.790	−0.692
ε Sagittarii	2.0	A0	18 18 35.774	3.9814	−.0041	−34 25 31.06	1.502	−0.122
109 Herculis	3.9	K0	18 20 7.085	2.5559	+.0139	+21 43 50.07	1.496	−0.261
α Telescopii	3.8	B3	18 20 44.715	+4.4499	−.0017	−46 0 57.43	1.744	−0.068
χ Draconis	3.7	F8	18 22 34.431	−1.0786	+.1176	+72 41 47.81	1.599	−0.372
λ Sagittarii	2.9	K0	18 22 47.209	+3.7027	−.0033	−25 28 9.43	+1.791	−0.199
c Serpentis	5.4	G5	18 25 18.673	3.1215	+.0015	− 2 2 25.95	2.174	−0.035
1 Aquilæ	4.1	K0	18 30 38.155	3.2646	−.0013	− 8 18 13.41	2.356	−0.315
ζ Pavonis	4.1	K0	18 33 13.415	7.0195	−.0057	−71 30 6.93	2.731	−0.165
α Lyræ (*Vega*)	0.1	A0	18 34 5.663	2.0314	+.0178	+38 42 17.36	3.251	+0.280
2 Aquilæ	4.7	F0	18 37 40.531	+3.2866	+.0020	− 9 8 1.93	+3.275	−0.006
φ Sagittarii	3.3	B8	18 40 24.515	3.7487	+.0034	−27 4 41.31	3.510	−0.006
110 Herculis	4.3	F5	18 42 2.740	2.5804	−.0019	+20 27 54.20	3.313	−0.344
6 Aquilæ	4.5	G0	18 42 43.048	3.1829	−.0009	− 4 50 19.26	3.692	−0.023
λ Pavonis	4.4	B2	18 44 26.221	5.5658	−.0030	−62 17 6.89	3.840	−0.022
β Lyræ †	*var.*	B2p	18 46 58.704	+2.2147	+.0004	+33 15 52.03	+4.075	−0.005
50 Draconis	5.4	A0	18 49 5.505	−1.9205	−.0031	+75 20 6.80	4.312	+0.051
ο Draconis †	4.8	K0	18 49 57.842	+0.8881	+.0116	+59 17 7.39	4.359	+0.023
σ Sagittarii	2.1	B3	18 50 3.394	3.7200	−.0003	−26 24 7.93	4.269	−0.075
θ Serpentis *pr.* †	4.5	A5	18 52 2.600	2.9822	+.0027	+ 4 5 36.22	4.541	+0.028
R Lyræ †	*var.*	Mb	18 52 46.762	+1.8260	+.0026	+43 50 5.54	+4.654	+0.078
γ Lyræ	3.3	A0	18 55 48.054	2.2435	−.0006	+32 34 24.91	4.827	−0.006
ε Aquilæ	4.2	K0	18 55 48.579	2.7221	−.0042	+14 57 11.98	4.752	−0.081
ζ Sagittarii †	2.7	A2	18 57 16.066	3.8178	−.0024	−30 0 5.20	4.938	−0.019
ζ Aquilæ	3.0	A0	19 1 32.941	2.7569	−.0008	+13 44 15.90	5.220	−0.099
λ Aquilæ	3.6	A0	19 1 47.467	+3.1834	−.0020	− 5 0 33.46	+5.257	−0.083
α Coronæ Australis	4.1	A2	19 3 45.474	4.0830	+.0051	−38 2 11.72	5.387	−0.118
ι Lyræ	5.1	B5	19 4 18.278	2.1413	+.0005	+35 58 4.02	5.545	−0.006
π Sagittarii	3.0	F2	19 4 46.144	3.5688	−.0005	−21 9 29.17	5.554	−0.036
ψ Sagittarii	4.9	F5	19 10 23.449	3.6801	+.0025	−25 24 8.98	6.025	−0.035
δ Draconis	3.2	K0	19 12 32.392	+0.0221	+.0175	+67 30 49.52	+6.327	+0.088
d Sagittarii	5.0	K0	19 12 43.247	+3.5109	−.0015	−19 6 12.12	+6.238	−0.017

ψ Draconis, star $6^{m}.1$, 30″.4 n. f.
70 Ophiuchi, comp. 6^{m}, 2″.1 s.

β Lyræ, var., $12^{d}.9$, $3^{m}.4$–$4^{m}.1$, star 7^{m}, 46″ s. f.
ο Draco., star $7^{m}.6$, 32″.1 n. pr.

θ Serpentis, star $5^{m}.4$, 22″.2 s. f.
R Lyræ, var., $46^{d}.4$, $4^{m}.0$–$4^{m}.7$.
ζ Sag., binary, $3^{m}.4$, $3^{m}.6$, 0″.5.

FOR JANUARY $0^{d}.975$, WASHINGTON MEAN TIME.

Name of Star.	Magnitude.	Spectrum.	Right Ascension.	Annual Variation.	Annual P. M.	Declination.	Annual Variation.
			h m s	s	s	° ′ ″	″
θ Lyræ	4.5	K0	19 13 27.107	+2.0808	−.0015	+37 59 0.86	+ 6.321
ω Aquilæ	5.1	A5	19 13 52.420	2.8158	−.0002	+11 26 35.12	6.364
κ Cygni	4.0	K0	19 15 9.742	+1.3878	+.0072	+53 12 46.93	6.578
τ Draconis	4.6	K0	19 17 10.673	−1.1362	−.0312	+73 11 59.63	6.733
δ Aquilæ	3.4	F0	19 21 15.794	+3.0249	+.0168	+ 2 56 47.17	7.041
β Cygni †	3.2	K0p	19 27 20.007	+2.4189	−.0002	+27 46 56.96	+ 7.445
ι Cygni	3.9	A2	19 27 35.322	1.5133	+.0023	+51 33 1.31	7.604
μ Aquilæ	4.6	K0	19 29 59.182	2.9312	+.0145	+ 7 11 59.58	7.524
h Sagittarii	4.7	B9	19 31 35.806	3.6530	+.0045	−25 4 11.96	7.773
κ Aquilæ	5.0	B0	19 32 22.409	3.2288	+.0005	− 7 12 54.00	7.864
θ Cygni	4.6	F5	19 34 11.354	+1.6089	−.0024	+50 1 33.80	+ 8.259
54 Sagittarii	5.4	K0	19 35 54.728	3.4386	+.0046	−16 29 12.42	8.099
β Sagittæ	4.4	K0	19 37 16.549	2.6939	+.0001	+17 16 50.45	8.223
15 Cygni	5.0	K0	19 41 14.869	2.1640	+.0068	+37 9 3.39	8.611
f Sagittarii	5.1	K0	19 41 27.794	3.5014	−.0099	−19 57 50.06	8.499
γ Aquilæ	2.8	K2	19 42 15.965	+2.8519	+.0007	+10 24 27.84	+ 8.648
δ Cygni †	3.0	A0	19 42 21.021	1.8760	+.0055	+44 55 30.53	8.702
δ Sagittæ	3.8	Map	19 43 38.540	2.6748	+.0004	+18 19 34.84	8.776
α Aquilæ (*Altair*)	0.9	A5	19 46 41.097	2.9271	+.0360	+ 8 38 44.21	9.376
η Aquilæ †	*var.*	G0	19 48 11.663	+3.0567	+.0005	+ 0 47 21.24	9.107
ε Draconis †	4.0	K0	19 48 27.939	−0.1881	+.0170	+70 3 14.24	+ 9.164
ι Sagittarii	4.2	K0	19 49 28.069	+4.1429	−.0017	−42 5 23.95	9.259
ε Pavonis	4.1	A0	19 50 53.723	6.9856	+.0112	−73 8 0.88	9.206
β Aquilæ	3.9	K0	19 51 11.228	2.9468	+.0025	+ 6 11 46.21	8.867
γ Sagittæ	3.7	K5	19 55 1.264	2.6673	+.0041	+19 15 47.78	9.668
c Sagittarii	4.6	Mb	19 57 29.714	+3.6927	+.0023	−27 56 39.49	+ 9.846
τ Aquilæ	5.6	K0	20 0 2.205	2.9308	+.0010	+ 7 2 25.31	10.055
θ Aquilæ	3.4	A0	20 6 58.275	3.0959	+.0020	− 1 4 17.03	10.552
o Cygni *seq.* †	4.0	K0p	20 10 59.242	+1.8901	+.0014	+46 29 9.86	10.848
κ Cephei †	4.4	B9	20 11 44.499	−1.9670	+.0025	+77 27 32.26	10.924
24 Vulpeculæ	5.4	K0	20 13 11.441	+2.5673	+.0017	+24 24 42.01	+10.993
α^2 Capricorni †	3.8	K0	20 13 23.716	3.3303	+.0040	−12 48 21.57	11.028
β Capricorni †	3.2	G0p	20 16 17.627	3.3732	+.0030	−15 2 50.73	11.237
α Pavonis	2.1	B3	20 19 0.575	4.7637	.0000	−57 0 19.20	11.334
γ Cygni	2.3	F8p	20 19 12.795	2.1527	+.0004	+39 59 14.03	11.442
π Capricorni †	5.2	B8	20 22 30.878	+3.4362	+.0004	−18 29 15.96	+11.675
ρ Capricorni †	5.0	F0	20 24 4.266	3.4245	−.0013	−18 5 31.78	11.767
41 Cygni	4.1	F5	20 25 57.846	2.4516	+.0014	+30 5 15.56	11.919
θ Cephei	4.3	A5	20 28 10.504	1.0116	+.0066	+62 42 41.18	12.058
ε Delphini	4.0	B5	20 29 12.011	+2.8664	+.0007	+11 1 1.28	12.122
Groombridge 3241	6.4	K2	20 30 22.763	−0.2394	−.0047	+72 14 49.78	+12.211
α Indi	3.2	K0	20 31 39.731	+4.2294	+.0027	−47 35 7.61	12.371
β Delphini †	3.7	F5	20 33 36.640	2.8138	+.0082	+14 18 8.02	12.417
υ Capricorni	5.3	Ma	20 35 16.187	3.4180	−.0018	−18 26 6.01	12.559
α Delphini	3.9	B8	20 35 44.201	2.7868	+.0047	+15 36 55.00	12.614
β Pavonis	3.6	A5	20 37 24.239	+5.4420	−.0079	−66 30 22.61	+12.707
α Cygni (*Deneb*)	1.3	A2p	20 38 34.074	2.0447	+.0004	+44 58 46.61	12.786
δ Delphini	4.5	A2	20 39 32.244	2.8008	−.0014	+14 46 20.78	12.804
ψ Capricorni	4.3	F8	20 41 7.495	3.5565	−.0041	−25 34 24.00	12.812
γ Delphini *seq.* †	4.5	G5	20 42 45.664	2.7832	−.0023	+15 49 15.31	12.873
ε Cygni	2.6	K0	20 42 48.741	+2.4275	+.0294	+33 39 18.08	+13.399
ε Aquarii	3.8	A0	20 43 7.805	3.2492	+.0017	− 9 48 14.23	13.063
η Cephei	3.6	K0	20 43 35.002	1.2244	+.0132	+61 30 44.08	13.943
μ Aquarii	4.8	A3	20 48 7.468	3.2377	+.0025	− 9 17 57.56	13.383
β Indi	3.7	K0	20 48 15.267	4.7108	+.0018	−58 46 18.40	13.421
32 Vulpeculæ	5.2	K2	20 50 58.781	+2.5563	−.0003	+27 44 15.30	+13.610

β Cygni, star $5^{m}.4$, 34″.7 n. f.
δ Cygni, comp. 8^{m}, 1″.6 n. pr.
η Aquilæ, var., $7^{d}.18$, $3^{m}.7$–$4^{m}.4$
ε Draconis, comp. $7^{m}.6$, 3″.1 n.

o Cygni, star $5^{m}.0$ pr. 19^{s}, 270″ n., star $7^{m}.8$ f. 1^{s}, 96″ s.
κ Cephei, comp. 8^{m}, 7″.5 s. f.
α^2 Capricor., α^1 Capricor. $4^{m}.6$ pr. 24^{s}, 137″ n.

β Capricor., star $6^{m}.2$ pr. 14^{s},
π Capricor., comp. 9^{m}, 3″.4 s.
ρ Capricor., comp. $7^{m}.6$, 2″.8 s
β Delphini, binary $4^{m}.1$, $5^{m}.4$,
γ Delphini, comp. $5^{m}.5$, 11″.2

FOR JANUARY 0^{d}.975, WASHINGTON MEAN TIME.

Name of Star.	Magnitude.	Spectrum.	Right Ascension.	Annual Variation.	Annual P. M.	Declination.	Annual Variation.	Annual P. M.
			h m s	s	s	° ′ ″	″	″
220 H^{1}. Draconis	5.6	K0	20 51 26.354	−2.6315	−.0105	+80 14 16.73	+13.610	−0.025
ν Cygni	4.0	A0	20 54 2.454	+2.2356	+.0008	+40 50 35.39	13.783	−0.018
α Octantis	5.2	F2	20 54 35.039	7.3790	−.0007	−77 20 44.90	13.446	−0.389
γ Microscopii	4.7	G5	20 56 8.573	3.6863	−.0004	−32 35 12.49	13.929	−0.004
θ Capricorni	4.2	A0	21 1 13.626	3.3753	+.0051	−17 34 2.73	14.184	−0.066
ξ Cygni	3.9	K5	21 1 52.493	+2.1813	+.0009	+43 35 32.37	+14.298	+0.008
61 Cygni *pr.*	5.6	K5	21 3 7.780	2.6853	+.3496	+38 20 8.51	17.615	+3.249
61 Cygni *seq.*	6.3	K5	Δα +1.501	. . .	. . .	Δδ −15.48	. . . .	. . .
ν Aquarii	4.5	K0	21 5 1.177	+3.2699	+.0057	−11 42 44.50	14.475	−0.006
Bradley 2777	5.9	A	21 7 12.344	−1.1432	+.0102	+77 47 9.47	14.642	+0.029
3 Piscis Australis	5.6	K5	21 8 18.644	+3.5632	+.0075	−27 57 45.42	+14.573	−0.106
ζ Cygni	3.4	K0	21 9 21.624	2.5521	−.0002	+29 52 54.35	14.680	−0.061
τ Cygni †	3.8	F0	21 11 26.242	2.3940	+.0141	+37 41 10.81	15.297	+0.434
α Equulei	4.1	F8p	21 11 37.506	2.9992	+.0034	+ 4 53 59.81	14.789	−0.085
σ Cygni	4.3	A0p	21 14 6.946	2.3548	−.0001	+39 2 32.10	15.023	+0.003
θ^{1} Microscopii	4.9	A2p	21 15 23.444	+3.8444	+.0028	−41 9 55.14	+15.098	+0.005
α Cephei	2.6	A5	21 16 34.588	1.4349	+.0224	+62 13 45.72	15.211	+0.050
ι Capricorni	4.3	K0	21 17 34.307	3.3440	+.0022	−17 11 34.54	15.222	+0.004
1 Pegasi	4.2	K0	21 18 12.090	2.7741	+.0075	+19 26 40.38	15.318	+0.064
γ Pavonis	4.3	F8	21 19 30.871	4.9996	+.0154	−65 44 50.38	16.112	+0.784
ζ Capricorni	3.9	G5p	21 21 52.463	+3.4301	+.0004	−22 46 32.88	+15.480	+0.020
g Cygni †	5.3	K0	21 26 20.928	2.2127	+.0050	+46 10 11.31	15.812	+0.105
β Aquarii	3.1	G0	21 27 8.282	3.1598	+.0012	− 5 56 28.85	15.739	−0.011
β Cephei †	3.3	B1	21 27 34.947	0.7857	+.0026	+70 11 30.44	15.779	+0.005
ξ Aquarii	4.8	A5	21 33 16.894	3.1956	+.0075	− 8 13 53.34	16.053	−0.023
74 Cygni	5.1	A5	21 33 34.888	+2.4034	+.0003	+40 2 8.40	+16.101	+0.009
γ Capricorni	3.8	F0p	21 35 26.349	3.3271	+.0129	−17 2 32.07	16.171	−0.017
ε Pegasi	2.5	K0	21 40 3.607	2.9461	+.0016	+ 9 29 21.56	16.423	0.000
11 Cephei	4.8	K0	21 40 41.728	0.8878	+.0221	+70 55 27.95	16.548	+0.093
δ Capricorni	3.0	A5	21 42 24.384	3.3140	+.0176	−16 30 32.51	16.243	−0.297
π^{2} Cygni	4.3	B3	21 43 41.324	+2.2146	+.0009	+48 55 13.83	+16.602	−0.001
μ Capricorni	5.2	F0	21 48 43.068	3.2729	+.0204	−13 56 52.27	16.846	+0.001
γ Gruis	3.2	B8	21 48 50.774	3.6408	+.0077	−37 45 38.01	16.830	−0.021
16 Pegasi	5.0	B3	21 49 14.353	2.7285	+.0005	+25 31 46.33	16.876	+0.006
79 Draconis	6.6	A0	21 51 48.529	0.7183	+.0100	+73 18 16.99	17.006	+0.016
ε Indi	4.7	K5	21 56 56.495	+4.6089	+.4784	−57 7 54.26	+14.652	−2.573
20 Pegasi	5.7	F2	21 56 59.793	2.9222	+.0038	+12 43 1.36	17.174	−0.054
α Aquarii	3.2	G0	22 1 28.213	3.0820	+.0010	− 0 43 42.04	17.422	−0.002
ι Aquarii	4.4	B8	22 1 54.120	3.2424	+.0022	−14 16 39.78	17.381	−0.062
20 Cephei	5.4	K5	22 2 27.298	1.8228	+.0032	+62 22 31.67	17.518	+0.051
α Gruis	2.2	B5	22 2 56.683	+3.7932	+.0110	−47 22 6.74	+17.313	−0.174
ι Pegasi	4.0	F5	22 3 5.985	2.7915	+.0222	+24 56 3.68	17.514	+0.020
θ Pegasi	3.7	A0	22 5 57.779	3.0267	+.0187	+ 5 47 3.19	17.650	+0.036
π Pegasi	4.4	F5	22 6 15.333	2.6627	−.0003	+32 45 56.25	17.608	−0.018
ζ Cephei	3.6	K0	22 7 56.287	2.0782	+.0018	+57 47 12.95	17.707	+0.010
24 Cephei	5.0	G5	22 8 11.728	+1.1575	+.0044	+71 55 37.91	+17.710	+0.004
θ Aquarii	4.3	K0	22 12 24.128	3.1671	+.0074	− 8 12 6.99	17.858	−0.019
α Tucanæ	2.9	K2	22 12 45.362	4.1340	−.0118	−60 40 42.90	17.856	−0.035
γ Aquarii	4.0	A0	22 17 19.086	3.0901	+.0081	− 1 48 39.31	18.082	+0.015
31 Pegasi	4.9	B3p	22 17 23.007	2.9530	+.0010	+11 46 53.43	18.076	+0.007
3 Lacertæ	4.6	K0	22 20 15.280	+2.3558	−.0007	+51 48 28.38	+17.988	−0.188
π Aquarii	4.6	B1	22 20 59.227	3.0637	+.0004	+ 0 57 2.49	18.203	−0.001
σ Aquarii	4.9	A0	22 26 12.213	3.1770	.0000	−11 6 29.24	18.364	−0.026
α Lacertæ	3.8	A0	22 27 49.732	2.4682	+.0157	+49 51 0.97	18.460	+0.014
υ Aquarii	5.3	F5	22 30 6.015	3.2849	+.0148	−21 8 20.46	18.369	−0.154
226 B. Cephei	5.7	A0	22 30 48.168	+1.0645	−.0052	+75 47 36.47	+18.546	0.000

τ Cygni, comp. 7^{m}, 0″.8 | g Cygni, star 6^{m}.7 f. 10^{s}, 420″ s. | β Cephei, star 8^{m}, 13″.3 s. pr.

FOR JANUARY $0^d.975$, WASHINGTON MEAN TIME.

Name of Star.	Magnitude.	Spectrum.	Right Ascension.	Annual Variation.	Annual P. M.	Declination.	Annual Variation.
			h m s	s	s	° ′ ″	″
η Aquarii	4.1	B8	22 31 2.420	+3.0832	+.0057	− 0 33 2.80	+18.501
10 Lacertæ	4.9	Oe5	22 35 29.414	2.6891	+.0011	+38 36 45.76	18.687
ε Piscis Australis	4.2	B8	22 36 0.724	3.3225	+.0008	−27 28 56.21	18.703
ζ Pegasi	3.6	B8	22 37 16.334	2.9915	+.0054	+10 23 32.93	18.740
β Gruis	2.2	Mb	22 37 39.444	3.5956	+.0133	−47 19 27.71	18.739
η Pegasi	3.1	G0	22 39 3.756	+2.8093	+.0011	+29 46 53.28	+18.771
λ Pegasi	4.1	K0	22 42 28.996	2.8870	+.0037	+23 7 23.87	18.901
ε Gruis	3.7	A2	22 43 29.198	3.6376	+.0093	−51 45 31.65	18.880
τ Aquarii	4.2	K5	22 45 8.778	3.1790	−.0008	−14 2 10.37	18.953
μ Pegasi	3.7	K0	22 45 56.855	2.8933	+.0110	+24 9 27.86	18.966
ι Cephei	3.7	K0	22 46 41.181	+2.1283	−.0111	+65 45 30.08	+18.903
λ Aquarii	3.8	Ma	22 48 13.982	3.1309	+.0002	− 8 1 36.81	19.106
ρ Indi	6.1	G5	22 48 49.737	4.2140	−.0133	−70 31 22.17	19.140
δ Aquarii	3.5	A2	22 50 11.621	3.1862	−.0034	−16 16 4.20	19.097
α Pisc. Aust. (*Fomalhaut*)	1.3	A3	22 53 0.729	3.3207	+.0252	−30 4 4.01	19.024
ο Andromedæ	3.6	B5p	22 58 3.161	+2.7548	+.0020	+41 52 27.39	+19.308
β Pegasi †	*var.*	Ma	22 59 42.002	2.9053	+.0146	+27 37 36.74	19.491
α Pegasi (*Markab*)	2.6	A0	23 0 34.516	2.9864	+.0040	+14 45 11.08	19.336
55 Pegasi	4.7	Ma	23 2 46.322	3.0209	+.0003	+ 8 57 19.55	19.412
c^2 Aquarii	3.8	K0	23 4 58.174	3.2019	+.0032	−21 37 43.16	19.512
π Cephei †	4.6	G5	23 5 13.335	+1.8997	+.0023	+74 55 59.63	+19.443
ι Gruis	4.1	K0	23 5 36.516	3.4067	+.0121	−45 42 7.14	19.452
59 Pegasi	5.2	A3	23 7 29.692	3.0278	−.0007	+ 8 15 49.65	19.526
5 H^1. Cassiopeiæ	5.6	K2	23 9 14.017	2.8791	+.2535	+56 42 16.13	19.854
φ Aquarii	4.4	Ma	23 9 58.342	3.1071	+.0015	− 6 30 7.44	19.375
ψ Aquarii †	4.5	K0	23 11 29.521	+3.1448	+.0250	− 9 32 43.58	+19.593
γ Tucanæ	4.1	F2	23 12 32.033	3.5189	−.0057	−58 41 48.44	19.678
γ Piscium	3.8	K0	23 12 48.622	3.1094	+.0502	+ 2 49 23.30	19.643
γ Sculptoris	4.5	K0	23 14 17.440	3.2447	+.0002	−32 59 23.46	19.582
ο Cephei †	4.9	G5	23 15 10.218	2.4522	+.0113	+67 39 6.39	19.681
τ Pegasi	4.6	A5	23 16 28.620	+2.9659	+.0018	+23 16 49.19	+19.673
b^1 Aquarii	4.2	K0	23 18 33.608	3.1529	−.0099	−20 33 33.70	19.629
4 Cassiopeiæ	5.2	K5	23 21 5.941	2.6508	−.0004	+61 49 17.45	19.748
υ Pegasi	4.6	G0	23 21 11.076	2.9907	+.0134	+22 56 29.14	19.789
κ Piscium	4.9	A2p	23 22 37.584	3.0752	+.0056	+ 0 47 44.38	19.687
θ Piscium	4.4	G5	23 23 42.376	+3.0420	−.0088	+ 5 55 2.99	+19.754
70 Pegasi	4.7	K0	23 24 54.306	3.0322	+.0040	+12 17 49.25	19.846
β Sculptoris	4.5	B9	23 28 28.231	3.2244	+.0071	−38 16 59.26	19.862
72 Pegasi (*mean*) †	5.2	K2	23 29 46.957	2.9711	+.0035	+30 51 42.00	19.862
λ Andromedæ	4.0	K0	23 33 26.900	2.9285	+.0158	+46 0 10.72	19.491
ι Andromedæ	4.3	B8	23 34 0.732	+2.9351	+.0025	+42 48 10.65	+19.916
ι Piscium	4.3	G0	23 35 37.741	3.0844	+.0246	+ 5 10 15.28	19.496
γ Cephei	3.4	K0	23 35 53.418	2.4395	−.0173	+77 9 48.73	20.092
κ Andromedæ	4.3	A0	23 36 15.986	2.9477	+.0078	+43 52 7.22	19.914
ω^2 Aquarii	4.6	A0	23 38 22.031	3.1127	+.0063	−15 0 33.66	19.894
ι^1 Aquarii	5.3	B8	23 39 50.782	+3.1144	+.0019	−18 44 35.88	+19.962
ψ Andromedæ	5.1	K0	23 41 52.003	2.9640	+.0005	+45 57 13.62	19.975
41 H. Cephei	5.0	A0	23 43 53.121	2.8501	+.0024	+67 20 23.90	19.986
δ Sculptoris	4.6	A0	23 44 33.113	3.1276	+.0059	−28 35 42.75	19.867
φ Pegasi	5.2	Ma	23 48 12.732	3.0482	−.0013	+18 39 13.42	19.980
ρ Cassiopeiæ	4.8	F8p	23 50 10.729	+2.9821	−.0022	+57 1 55.46	+20.029
Groombridge 4163	6.6	B9	23 50 43.583	2.8808	−.0040	+73 56 34.20	20.024
ω Piscium	4.0	F5	23 54 59.818	3.0796	+.0102	+ 6 23 53.99	19.933
ε Tucanæ	4.7	B9	23 55 33.604	3.1385	+.0076	−66 2 39.06	20.034
30 Piscium	4.7	Mb	23 57 39.136	3.0771	+.0030	− 6 28 51.21	20.007
2 Ceti	4.6	A0	23 59 26.264	+3.0752	+.0015	−17 48 13.25	+20.032

β Pegasi, var. irreg., $2^m.2$–$2^m.7$
π Cephei, comp. 7^m, $0''.9$ f.

ψ Aquarii, star $8^m.5$, $49''.4$ n. pr.
ο Cephei, comp. 8^m, $2''.9$ s. pr.

72 Pegasi, binary, $6^m.0$, $6^m.0$, 0

FOR JANUARY 0^{d}.975, WASHINGTON MEAN TIME.

Name of Star.	Magnitude.	Spectrum.	Right Ascension.	Annual Variation.	Annual P. M.	Declination.	Annual Variation.	Annual P. M.
			h m s	s	s	° ′ ″	″	″
13 H. Cephei . .	4.5	K0	0 57 1.657	+ 7.6349	+.0729	+85 48 25.87	+19.424	−0.004
α Ursæ Min. (*Polaris*) . †	2.1	F8	1 29 44.254	+28.7793	+.1465	+88 51 25.03	+18.530	+0.002
4 G. Octantis . .	5.6	K0	1 42 6.102	− 3.7682	+.0086	−85 11 39.58	+18.116	+0.028
Groombridge 750 .	6.7	F8	4 9 44.952	+17.5995	+.0128	+85 20 1.04	+ 9.318	+0.042
Groombridge 944 .	6.4	K0	5 34 54.014	+18.7661	+.0130	+85 9 28.07	+ 2.187	−0.004
31 G. Mensæ . .	6.2	A0	5 46 26.439	−11.6839	−.0124	−84 49 48.17	+ 1.272	+0.087
ζ Mensæ . . .	5.6	A2	6 47 3.489	− 4.9433	−.0037	−80 43 34.16	− 4.005	+0.082
51 H. Cephei . .	5.3	Ma	7 1 34.861	+29.2025	−.0577	+87 11 0.11	− 5.356	−0.035
25 H. Camelopardalis .	5.1	Mb	7 13 29.477	+12.8200	+.0132	+82 34 36.50	− 6.365	−0.047
7 G. Octantis . .	6.4	F5	7 16 40.555	−20.2494	−.0146	−86 54 0.14	− 6.576	+0.005
Groombridge 1119 .	7.0	A0	8 14 48.311	+60.2322	−.0408	+88 53 11.43	−11.105	+0.017
ζ Octantis . . .	5.4	A3	9 9 6.085	− 8.1380	−.1147	−85 19 42.77	−14.683	+0.043
1 H. Draconis . .	4.6	K0	9 25 12.930	+ 8.7932	−.0059	+81 41 57.18	−15.672	−0.027
ζ Chamæleontis . .	5.2	B3	9 36 24.003	− 1.6544	−.0121	−80 33 50.61	−16.219	+0.019
30 H. Camelopardalis .	5.3	F5	10 20 57.259	+ 7.5763	−.0463	+82 59 12.27	−18.194	+0.009
η Octantis . . .	6.3	A0	10 59 55.642	− 0.3598	−.0573	−84 8 31.24	−19.366	−0.005
Bradley 1672 . .	6.3	F0	12 14 28.053	+ 0.3686	−.0718	+88 9 56.03	−19.947	+0.058
ι Octantis . . .	5.4	K0	12 46 1.183	+ 5.9648	+.0365	−84 40 2.72	−19.619	+0.024
32 H. Camelop. *seq.* . †	5.3	A2	12 48 29.976	+ 0.4408	−.0184	+83 52 10.05	−19.582	+0.016
κ Octantis . . .	5.6	A2	13 27 5.514	+ 9.0989	−.0763	−85 21 23.59	−18.639	−0.024
δ Octantis . . .	4.1	K2	14 13 18.531	+ 9.2573	−.0510	−83 17 4.27	−16.763	−0.014
Groombridge 2283 .	7.2	K0	15 4 0.607	−19.4646	−.0066	+87 33 24.43	−13.894	+0.031
ρ Octantis . . .	5.7	A2	15 23 43.237	+13.3505	+.0842	−84 11 17.84	−12.554	+0.080
ε Ursæ Minoris . .	4.4	G5	16 54 31.741	− 6.2545	+.0057	+82 10 38.40	− 5.650	−0.001
59 G. Apodis . .	5.9	Mb	17 15 43.730	+11.1646	+.0086	−80 47 2.69	− 3.887	−0.039
δ Ursæ Minoris . .	4.4	A0	17 59 20.805	−19.4980	+.0176	+86 36 51.19	− 0.009	+0.048
χ Octantis . . .	5.2	K0	18 5 36.163	+35.7319	−.0972	−87 39 52.21	+ 0.364	−0.126
λ Ursæ Minoris . .	6.6	Mb	19 3 51.560	−71.8229	−.1100	+89 0 56.70	+ 5.519	+0.006
σ Octantis . . .	5.5	F0	19 26 7.189	+95.2774	+.1087	−89 13 35.99	+ 7.356	−0.001
76 Draconis . . .	5.7	A0	20 48 44.660	− 4.1628	+.0131	+82 13 16.38	+13.486	+0.025
λ Octantis . . . †	5.4	G0p	21 38 10.025	+ 9.5240	+.0389	−83 6 23.31	+16.315	−0.012
υ Octantis . . .	5.7	K0	22 15 56.333	+12.3385	−.0400	−86 23 45.22	+18.089	+0.074
β Octantis . . .	4.3	F0	22 37 32.703	+ 6.3165	−.0303	−81 49 21.11	+18.764	+0.002
39 H. Cephei . .	5.6	F0	23 27 44.392	− 0.2642	+.0638	+86 50 39.03	+19.867	+0.020
γ^{1} Octantis . . .	5.1	G5	23 47 12.813	+ 3.6130	−.0248	−82 29 8.43	+20.003	−0.012

α Ursæ Min., star 9^{m}, 18″ s. pr. | 32 H. Camelop., star 5^{m}, 19″.8 s. pr. | λ Octantis, binary, 5^{m}.5, 8^{m}.0, 3″.2 n. f.

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			**ζ Octantis.** Mag. 5.4			**1 H. Draconis.** Mag. 4.6			**ζ Chamæleontis.** Mag. 5.2			**30 H. Camelop.** Mag. 5.3		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Jan.	8 16	+88 53	Jan.	9 9	−85 19	Jan.	9 25	+81 41	Jan.	9 36	−80 33	Jan.	10 21	+82 58
	s	″		s	″		s	″		s	″		s	″
0.6	17.56	4.27	0.6	13.87	30.42	0.6	24.08	42.59	0.6	27.67	37.61	0.7	8.04	52.69
1.6	18.23	4.47	1.6	14.02	30.80	1.6	24.22	42.70	1.6	27.78	37.98	1.7	8.21	52.77
2.6	18.96	4.69	2.6	14.14	31.19	2.6	24.35	42.83	2.6	27.88	38.36	2.6	8.39	52.84
3.6	19.75	4.93	3.6	14.24	31.58	3.6	24.50	42.97	3.6	27.96	38.73	3.6	8.58	52.92
4.6	20.56	5.18	4.6	14.34	31.96	4.6	24.65	43.14	4.6	28.02	39.10	4.6	8.78	53.00
5.6	21.36	5.46	5.6	14.40	32.30	5.6	24.81	43.32	5.6	28.08	39.48	5.6	8.98	53.10
6.6	22.09	5.77	6.6	14.48	32.63	6.6	24.96	43.54	6.6	28.14	39.82	6.6	9.18	53.24
7.5	22.73	6.10	7.6	14.56	32.94	7.6	25.10	43.78	7.6	28.20	40.13	7.6	9.38	53.41
8.5	23.26	6.42	8.6	14.64	33.27	8.6	25.21	44.02	8.6	28.25	40.44	8.6	9.54	53.59
9.5	23.70	6.75	9.6	14.74	33.58	9.6	25.32	44.27	9.6	28.32	40.75	9.6	9.69	53.78
10.5	24.04	7.05	10.6	14.85	33.92	10.6	25.41	44.51	10.6	28.40	41.06	10.6	9.83	53.97
11.5	24.37	7.33	11.6	14.97	34.28	11.6	25.51	44.74	11.6	28.48	41.41	11.6	9.97	54.15
12.5	24.67	7.62	12.6	15.08	34.66	12.6	25.59	44.96	12.6	28.56	41.78	12.6	10.10	54.35
13.5	24.99	7.89	13.6	15.19	35.04	13.6	25.67	45.16	13.6	28.63	42.14	13.6	10.22	54.51
14.5	25.36	8.15	14.6	15.28	35.46	14.6	25.76	45.36	14.6	28.69	42.54	14.6	10.35	54.66
15.5	25.76	8.41	15.6	15.35	35.86	15.6	25.86	45.56	15.6	28.76	42.96	15.6	10.50	54.81
16.5	26.18	8.69	16.6	15.41	36.27	16.6	25.96	45.76	16.6	28.81	43.35	16.6	10.64	54.97
17.5	26.61	8.98	17.6	15.46	36.65	17.6	26.07	45.98	17.6	28.86	43.74	17.6	10.79	55.14
18.5	27.05	9.28	18.6	15.48	37.05	18.6	26.18	46.21	18.6	28.90	44.13	18.6	10.95	55.32
19.5	27.48	9.59	19.6	15.50	37.41	19.6	26.29	46.47	19.6	28.94	44.51	19.6	11.11	55.51
20.5	27.84	9.91	20.6	15.52	37.78	20.6	26.40	46.74	20.6	28.98	44.87	20.6	11.27	55.73
21.5	28.15	10.27	21.5	15.54	38.12	21.6	26.50	47.03	21.6	29.00	45.22	21.6	11.42	55.97
22.5	28.38	10.62	22.5	15.55	38.45	22.6	26.58	47.32	22.6	29.03	45.57	22.6	11.56	56.24
23.5	28.53	10.96	23.5	15.58	38.80	23.6	26.65	47.62	23.6	29.06	45.91	23.6	11.68	56.50
24.5	28.59	11.32	24.5	15.62	39.15	24.6	26.70	47.92	24.6	29.10	46.26	24.6	11.79	56.76
25.5	28.60	11.64	25.5	15.67	39.52	25.5	26.76	48.20	25.6	29.14	46.63	25.6	11.88	57.01
26.5	28.60	11.94	26.5	15.71	39.89	26.5	26.80	48.46	26.6	29.18	47.01	26.6	11.96	57.26
27.5	28.60	12.22	27.5	15.75	40.32	27.5	26.85	48.71	27.6	29.23	47.42	27.6	12.06	57.49
28.5	28.64	12.50	28.5	15.77	40.75	28.5	26.90	48.94	28.5	29.27	47.84	28.6	12.15	57.69
29.5	28.76	12.76	29.5	15.78	41.19	29.5	26.96	49.18	29.5	29.30	48.29	29.6	12.25	57.89
30.5	28.93	13.03	30.5	15.78	41.62	30.5	27.04	49.40	30.5	29.32	48.73	30.6	12.36	58.08
31.5	29.13	13.30	31.5	15.73	42.05	31.5	27.13	49.64	31.5	29.33	49.17	31.6	12.49	58.28
	51.42	+51.41		12.27	−12.23		6.92	+6.85		6.10	−6.02		8.18	+8.12
8^{h}	14^{m}	$48^{s}.311$	9^{h}	9^{m}	$6^{s}.085$	9^{h}	25^{m}	$12^{s}.930$	9^{h}	36^{m}	$24^{s}.003$	10^{h}	20^{m}	$57^{s}.259$
+88°	53′	11″.43	−85°	19′	42″.77	+81°	41′	57″.18	−80°	33′	50″.61	+82°	59′	12″.27

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

η Octantis. **Mag. 6.3**			**Bradley 1672.** **Mag. 6.3**			**ι Octantis.** **Mag. 5.4**			**32 H. Camelop. *seq.*** **Mag. 5.3**			**κ Octantis.** **Mag. 5.6**		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Jan.	10 59	−84 8	Jan.	12 14	+88 9	Jan.	12 45	−84 39	Jan.	12 48	+83 51	Jan.	13 27	−85 21
	s	″		s	″		s	″		s	″		s	″
0.7	57.62	16.46	0.7	43.13	30.10	0.8	58.34	48.72	0.8	32.63	43.39	0.8	0.11	10.70
1.7	57.84	16.75	1.7	43.73	30.05	1.8	58.64	48.81	1.8	32.82	43.27	1.8	0.46	10.73
2.7	58.05	17.04	2.7	44.36	29.99	2.7	58.94	48.95	2.8	33.01	43.14	2.8	0.81	10.78
3.7	58.24	17.33	3.7	45.05	29.91	3.7	59.22	49.11	3.7	33.23	43.01	3.8	1.15	10.87
4.7	58.42	17.62	4.7	45.78	29.83	4.7	59.47	49.29	4.7	33.45	42.88	4.8	1.46	10.96
5.7	58.56	17.90	5.7	46.56	29.77	5.7	59.72	49.45	5.7	33.69	42.77	5.8	1.74	11.06
6.7	58.72	18.17	6.7	47.35	29.75	6.7	59.94	49.59	6.7	33.93	42.67	6.8	2.02	11.16
7.7	58.87	18.42	7.7	48.15	29.75	7.7	60.17	49.71	7.7	34.17	42.62	7.8	2.29	11.23
8.7	59.02	18.65	8.7	48.90	29.79	8.7	60.39	49.81	8.7	34.40	42.59	8.8	2.55	11.27
9.7	59.19	18.87	9.7	49.61	29.84	9.7	60.62	49.90	9.7	34.63	42.59	9.8	2.83	11.31
10.7	59.38	19.12	10.7	50.27	29.89	10.7	60.88	49.99	10.7	34.83	42.59	10.8	3.13	11.35
11.7	59.56	19.39	11.7	50.88	29.97	11.7	61.15	50.09	11.7	35.02	42.59	11.8	3.44	11.39
12.6	59.76	19.67	12.7	51.47	30.02	12.7	61.42	50.22	12.7	35.21	42.60	12.8	3.77	11.43
13.6	59.95	19.96	13.7	52.04	30.06	13.7	61.70	50.38	13.7	35.40	42.60	13.7	4.10	11.50
14.6	60.13	20.28	14.7	52.63	30.11	14.7	61.98	50.54	14.7	35.59	42.60	14.7	4.44	11.60
15.6	60.31	20.61	15.7	53.24	30.14	15.7	62.26	50.72	15.7	35.78	42.58	15.7	4.78	11.72
16.6	60.48	20.93	16.7	53.88	30.19	16.7	62.52	50.92	16.7	35.98	42.55	16.7	5.10	11.86
17.6	60.63	21.27	17.7	54.55	30.22	17.7	62.77	51.13	17.7	36.20	42.53	17.7	5.42	12.01
18.6	60.77	21.62	18.7	55.24	30.24	18.7	63.01	51.35	18.7	36.42	42.52	18.7	5.71	12.16
19.6	60.89	21.94	19.7	55.98	30.31	19.7	63.24	51.57	19.7	36.65	42.52	19.7	5.99	12.31
20.6	61.01	22.26	20.7	56.70	30.39	20.7	63.45	51.78	20.7	36.88	42.53	20.7	6.26	12.46
21.6	61.13	22.57	21.7	57.42	30.48	21.7	63.66	51.98	21.7	37.11	42.57	21.7	6.53	12.61
22.6	61.25	22.87	22.7	58.13	30.61	22.7	63.87	52.16	22.7	37.34	42.65	22.7	6.78	12.74
23.6	61.37	23.17	23.7	58.81	30.74	23.7	64.08	52.35	23.7	37.55	42.73	23.7	7.05	12.88
24.6	61.50	23.45	24.7	59.43	30.90	24.7	64.30	52.53	24.7	37.75	42.82	24.7	7.31	13.01
25.6	61.64	23.77	25.7	60.01	31.07	25.7	64.54	52.71	25.7	37.95	42.93	25.7	7.61	13.12
26.6	61.79	24.10	26.7	60.54	31.24	26.7	64.79	52.90	26.7	38.12	43.03	26.7	7.92	13.25
27.6	61.94	24.46	27.7	61.05	31.38	27.7	65.06	53.12	27.7	38.30	43.13	27.7	8.25	13.41
28.6	62.09	24.83	28.7	61.54	31.50	28.7	65.33	53.38	28.7	38.47	43.19	28.7	8.58	13.59
29.6	62.23	25.22	29.7	62.07	31.61	29.7	65.57	53.66	29.7	38.64	43.24	29.7	8.91	13.80
30.6	62.35	25.63	30.7	62.63	31.71	30.7	65.82	53.95	30.7	38.82	43.29	30.7	9.22	14.04
31.6	62.45	26.04	31.6	63.24	31.81	31.7	66.05	54.26	31.7	39.03	43.35	31.7	9.52	14.29
	9.79	−9.74		31.12	+31.10		10.75	−10.71		9.35	+9.30		12.34	−12.30
$10^h\ 59^m\ 55^s.642$			$12^h\ 14^m\ 28^s.053$			$12^h\ 46^m\ 1^s.183$			$12^h\ 48^m\ 29^s.976$			$13^h\ 27^m\ 5^s.514$		
−84° 8′ 31″.24			+88° 9′ 56″.03			−84° 40′ 2″.72			+83° 52′ 10″.05			−85° 21′ 23″.59		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			**Groombridge 2283.** Mag. 7.2			**ρ Octantis.** Mag. 5.7			**ε Ursæ Minoris.** Mag. 4.4			**59 G. Apodis.** Mag. 5.9		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Jan.	14 13	−83 16	Jan.	15 3	+87 32	Jan.	15 23	−84 11	Jan.	16 54	+82 10	Jan.	17 15	−80 46
	s	″		s	″		s	″		s	″		s	″
0.8	13.64	53.26	0.8	42.15	60.59	0.9	35.54	10.31	0.9	21.80	22.92	0.9	38.26	62.20
1.8	13.89	53.23	1.8	42.43	60.33	1.9	35.80	10.13	1.9	21.85	22.61	1.9	38.38	61.90
2.8	14.13	53.21	2.8	42.72	60.06	2.9	36.06	10.01	2.9	21.88	22.27	2.9	38.51	61.63
3.8	14.37	53.22	3.8	43.03	59.79	3.9	36.32	9.89	3.9	21.92	21.91	3.9	38.64	61.38
4.8	14.59	53.26	4.8	43.38	59.51	4.9	36.57	9.81	4.9	21.97	21.55	4.9	38.76	61.15
5.8	14.83	53.30	5.8	43.78	59.22	5.8	36.81	9.74	5.9	22.02	21.18	5.9	38.88	60.93
6.8	15.01	53.31	6.8	44.21	58.96	6.8	37.02	9.66	6.9	22.10	20.81	6.9	38.99	60.72
7.8	15.21	53.33	7.8	44.66	58.71	7.8	37.22	9.58	7.9	22.18	20.46	7.9	39.09	60.55
8.8	15.39	53.31	8.8	45.14	58.49	8.8	37.43	9.47	8.9	22.27	20.13	8.9	39.18	60.33
9.8	15.58	53.28	9.8	45.59	58.31	9.8	37.63	9.35	9.9	22.35	19.81	9.9	39.26	60.08
10.8	15.79	53.25	10.8	46.03	58.14	10.8	37.85	9.23	10.9	22.44	19.53	10.9	39.36	59.81
11.8	16.01	53.23	11.8	46.42	57.98	11.8	38.08	9.08	11.9	22.53	19.26	11.9	39.45	59.54
12.8	16.24	53.21	12.8	46.84	57.84	12.8	38.33	8.94	12.9	22.62	19.00	12.9	39.57	59.26
13.8	16.48	53.21	13.8	47.23	57.69	13.8	38.59	8.82	13.9	22.70	18.74	13.9	39.70	58.99
14.8	16.71	53.24	14.8	47.60	57.52	14.8	38.86	8.71	14.9	22.78	18.47	14.9	39.84	58.73
15.8	16.96	53.27	15.8	47.99	57.35	15.8	39.13	8.63	15.9	22.86	18.20	15.9	39.97	58.49
16.8	17.19	53.33	16.8	48.39	57.17	16.8	39.40	8.57	16.9	22.94	17.92	16.9	40.11	58.28
17.8	17.43	53.41	17.8	48.82	56.99	17.8	39.67	8.54	17.9	23.03	17.61	17.9	40.26	58.08
18.8	17.66	53.49	18.8	49.27	56.80	18.8	39.92	8.52	18.9	23.12	17.30	18.9	40.40	57.88
19.8	17.86	53.58	19.8	49.75	56.62	19.8	40.17	8.50	19.9	23.23	16.99	19.9	40.54	57.72
20.8	18.06	53.68	20.8	50.25	56.45	20.8	40.41	8.48	20.9	23.34	16.69	20.9	40.67	57.56
21.8	18.26	53.77	21.8	50.77	56.30	21.8	40.64	8.45	21.9	23.46	16.40	21.9	40.79	57.40
22.8	18.45	53.86	22.8	51.30	56.16	22.8	40.85	8.42	22.9	23.58	16.12	22.9	40.91	57.23
23.8	18.64	53.91	23.8	51.83	56.05	23.8	41.09	8.39	23.9	23.71	15.87	23.9	41.03	57.04
24.8	18.84	53.96	24.8	52.34	55.97	24.8	41.31	8.33	24.9	23.83	15.62	24.9	41.15	56.85
25.7	19.05	54.02	25.8	52.83	55.90	25.8	41.56	8.26	25.9	23.96	15.41	25.9	41.27	56.65
26.7	19.29	54.07	26.8	53.28	55.83	26.8	41.82	8.21	26.9	24.07	15.20	26.9	41.40	56.43
27.7	19.53	54.14	27.8	53.72	55.77	27.8	42.09	8.17	27.9	24.18	15.02	27.9	41.55	56.20
28.7	19.78	54.26	28.8	54.13	55.72	28.8	42.38	8.13	28.9	24.29	14.83	28.9	41.72	55.99
29.7	20.03	54.39	29.8	54.53	55.62	29.8	42.69	8.13	29.8	24.40	14.61	29.9	41.89	55.80
30.7	20.28	54.57	30.8	54.97	55.50	30.8	42.99	8.17	30.8	24.52	14.38	30.9	42.06	55.63
31.7	20.51	54.74	31.8	55.42	55.37	31.8	43.28	8.22	31.8	24.64	14.13	31.9	42.24	55.50
	8.55	−8.49		23.39	+23.36		9.87	−9.82		7.34	+7.27		6.24	−6.16
14^h	13^m	$18^s.531$	15^h	4^m	$0^s.607$	15^h	23^m	$43^s.237$	16^h	54^m	$31^s.741$	17^h	15^m	$43^s.730$
−83°	17′	4″.27	+87°	33′	24″.43	−84°	11′	17″.84	+82°	10′	38″.40	−80°	47′	2″.69

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Ursæ Minoris. Mag. 4.4			**χ Octantis.** Mag. 5.2			**λ Ursæ Minoris.** Mag. 6.6			**σ Octantis.** Mag. 5.5			**76 Draconis.** Mag. 5.7		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Jan.	17 58	+86 36	Jan.	18 5	−87 39	Jan.	19 2	+89 0	Jan.	19 25	−89 13	Jan.	20 48	+82 13
	s	″		s	″		s	″		s	″		s	″
0.9	52.98	42.45	0.9	12.67	54.70	1.0	8.38	55.32	1.0	3.13	43.37	1.1	33.38	26.77
1.9	52.94	42.13	1.9	12.95	54.34	2.0	7.93	55.06	2.0	3.31	42.95	2.1	33.28	26.57
2.9	52.91	41.81	2.9	13.28	54.00	3.0	7.43	54.77	3.0	3.63	42.56	3.1	33.18	26.36
3.9	52.86	41.47	3.9	13.63	53.68	4.0	6.91	54.45	4.0	4.05	42.18	4.1	33.07	26.13
4.9	52.84	41.10	4.9	13.98	53.39	5.0	6.41	54.11	5.0	4.51	41.86	5.1	32.96	25.87
5.9	52.84	40.74	5.9	14.32	53.10	6.0	5.99	53.75	6.0	4.95	41.52	6.1	32.85	25.31
6.9	52.87	40.35	6.9	14.61	52.83	6.9	5.66	53.39	7.0	5.30	41.21	7.1	32.74	25.29
7.9	52.92	39.97	7.9	14.87	52.57	7.9	5.45	53.03	8.0	5.57	40.92	8.1	32.65	24.95
8.9	53.01	39.62	8.9	15.11	52.28	8.9	5.35	52.66	9.0	5.76	40.59	9.1	32.56	24.64
9.9	53.11	39.30	9.9	15.35	51.98	9.9	5.34	52.33	10.0	5.89	40.26	10.1	32.49	24.34
10.9	53.23	38.99	10.9	15.60	51.67	10.9	5.37	52.02	11.0	6.03	39.90	11.1	32.43	24.03
11.9	53.33	38.70	11.9	15.87	51.33	11.9	5.41	51.72	12.0	6.22	39.52	12.1	32.37	23.74
12.9	53.43	38.42	12.9	16.17	50.99	12.9	5.42	51.43	12.9	6.48	39.12	13.1	32.32	23.47
13.9	53.52	38.14	13.9	16.52	50.64	13.9	5.40	51.14	13.9	6.86	38.73	14.1	32.26	23.20
14.9	53.60	37.86	14.9	16.89	50.30	14.9	5.36	50.85	14.9	7.34	38.34	15.0	32.21	22.94
15.9	53.68	37.57	15.9	17.30	49.98	15.9	5.28	50.55	15.9	7.92	37.96	16.0	32.16	22.69
16.9	53.77	37.26	16.9	17.72	49.69	16.9	5.21	50.23	16.9	8.60	37.60	17.0	32.09	22.43
17.9	53.85	36.94	17.9	18.15	49.40	17.9	5.13	49.90	17.9	9.33	37.23	18.0	32.02	22.13
18.9	53.95	36.60	18.9	18.59	49.15	18.9	5.09	49.58	18.9	10.08	36.88	19.0	31.96	21.82
19.9	54.07	36.25	19.9	19.02	48.91	19.9	5.09	49.24	19.9	10.84	36.57	20.0	31.90	21.50
20.9	54.21	35.90	20.9	19.42	48.67	20.9	5.15	48.88	20.9	11.56	36.28	21.0	31.83	21.14
21.9	54.37	35.56	21.9	19.81	48.43	21.9	5.31	48.52	21.9	12.25	35.97	22.0	31.77	20.78
22.9	54.55	35.22	22.9	20.18	48.18	22.9	5.55	48.17	22.9	12.88	35.65	23.0	31.73	20.42
23.9	54.75	34.91	23.9	20.54	47.92	23.9	5.87	47.83	23.9	13.46	35.33	24.0	31.70	20.07
24.9	54.95	34.62	24.9	20.91	47.67	24.9	6.25	47.51	24.9	14.02	34.99	25.0	31.68	19.75
25.9	55.16	34.34	25.9	21.28	47.39	25.9	6.64	47.22	25.9	14.60	34.64	26.0	31.67	19.43
26.9	55.35	34.11	26.9	21.69	47.07	26.9	7.04	46.94	26.9	15.24	34.28	27.0	31.66	19.13
27.9	55.54	33.88	27.9	22.14	46.77	27.9	7.39	46.66	27.9	16.01	33.91	28.0	31.64	18.84
28.9	55.70	33.65	28.9	22.66	46.48	28.9	7.66	46.38	28.9	16.91	33.52	29.0	31.63	18.57
29.9	55.85	33.40	29.9	23.21	46.21	29.9	7.88	46.11	29.9	17.97	33.15	30.0	31.62	18.31
30.9	56.00	33.15	30.9	23.79	45.96	30.9	8.06	45.84	30.9	19.16	32.80	31.0	31.58	18.02
31.9	56.17	32.87	31.9	24.37	45.76	31.9	8.24	45.54	31.9	20.40	32.46	32.0	31.54	17.70
	16.91	+16.88		24.53	−24.51		58.11	+58.11		74.14	−74.14		7.39	+7.32
$17^h\ 59^m\ 20^s.805$			$18^h\ 5^m\ 36^s.163$			$19^h\ 3^m\ 51^s.560$			$19^h\ 26^m\ 7^s.189$			$20^h\ 48^m\ 44^s.660$		
+86° 36′ 51″.19			−87° 39′ 52″.21			+89° 0′ 56″.70			−89° 13′ 35″.99			+82° 13′ 16″.38		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis.			**υ Octantis.**			**β Octantis.**			**39 H. Cephei.**			**γ^1 Octantis.**		
Mag. 5.4			Mag. 5.7			Mag. 4.3			Mag. 5.6			Mag. 5.1		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Jan.	21 38	−83 6	Jan.	22 15	−86 23	Jan.	22 37	−81 49	Jan.	23 27	+86 50	Jan.	23 47	−82 29
	s	″		s	″		s	″		s	″		s	″
1.1	6.92	36.69	1.1	52.12	59.54	1.2	31.91	35.75	1.2	30.51	62.88	1.2	14.19	23.41
2.1	6.83	36.35	2.1	51.87	59.21	2.2	31.80	35.48	2.2	30.17	62.87	2.2	14.03	23.23
3.1	6.76	36.01	3.1	51.66	58.88	3.2	31.70	35.19	3.2	29.81	62.86	3.2	13.88	23.03
4.1	6.71	35.67	4.1	51.48	58.56	4.2	31.61	34.89	4.2	29.41	62.86	4.2	13.75	22.81
5.1	6.66	35.34	5.1	51.33	58.25	5.2	31.53	34.64	5.2	29.00	62.84	5.2	13.62	22.61
6.1	6.62	35.05	6.1	51.17	57.97	6.1	31.46	34.39	6.2	28.56	62.78	6.2	13.50	22.41
7.1	6.57	34.78	7.1	51.01	57.72	7.1	31.39	34.14	7.2	28.13	62.68	7.2	13.39	22.25
8.1	6.50	34.50	8.1	50.83	57.47	8.1	31.30	33.92	8.2	27.69	62.58	8.2	13.26	22.10
9.1	6.42	34.24	9.1	50.64	57.21	9.1	31.22	33.71	9.2	27.30	62.46	9.2	13.12	21.96
10.1	6.34	33.95	10.1	50.42	56.94	10.1	31.11	33.48	10.2	26.93	62.33	10.2	12.97	21.80
11.1	6.25	33.64	11.1	50.19	56.66	11.1	31.00	33.24	11.2	26.59	62.20	11.2	12.82	21.63
12.1	6.16	33.31	12.1	49.95	56.38	12.1	30.88	32.97	12.2	26.27	62.07	12.2	12.66	21.46
13.1	6.07	32.98	13.1	49.72	56.06	13.1	30.77	32.70	13.2	25.98	61.95	13.2	12.50	21.27
14.1	6.00	32.63	14.1	49.50	55.72	14.1	30.67	32.40	14.2	25.68	61.83	14.2	12.34	21.04
15.1	5.94	32.26	15.1	49.31	55.38	15.1	30.57	32.08	15.2	25.36	61.73	15.2	12.20	20.81
16.1	5.89	31.89	16.1	49.13	55.04	16.1	30.48	31.77	16.2	25.04	61.63	16.2	12.05	20.57
17.1	5.85	31.53	17.1	48.99	54.69	17.1	30.41	31.44	17.2	24.69	61.52	17.2	11.92	20.33
18.1	5.83	31.16	18.1	48.87	54.33	18.1	30.36	31.11	18.2	24.33	61.42	18.2	11.81	20.06
19.1	5.82	30.82	19.1	48.76	54.00	19.1	30.30	30.81	19.1	23.96	61.29	19.2	11.70	19.80
20.1	5.80	30.48	20.1	48.66	53.67	20.1	30.25	30.52	20.1	23.59	61.12	20.2	11.60	19.55
21.1	5.78	30.17	21.1	48.55	53.34	21.1	30.20	30.22	21.1	23.21	60.96	21.2	11.49	19.31
22.1	5.75	29.85	22.1	48.45	53.05	22.1	30.14	29.93	22.1	22.84	60.76	22.2	11.39	19.09
23.1	5.72	29.53	23.1	48.33	52.74	23.1	30.08	29.64	23.1	22.50	60.56	23.2	11.28	18.85
24.1	5.68	29.24	24.1	48.20	52.45	24.1	30.01	29.37	24.1	22.16	60.34	24.1	11.16	18.64
25.1	5.64	28.92	25.1	48.04	52.13	25.1	29.92	29.08	25.1	21.87	60.12	25.1	11.03	18.41
26.1	5.60	28.55	26.1	47.86	51.79	26.1	29.84	28.78	26.1	21.59	59.90	26.1	10.89	18.18
27.1	5.54	28.19	27.1	47.71	51.43	27.1	29.75	28.44	27.1	21.35	59.70	27.1	10.75	17.91
28.1	5.50	27.80	28.1	47.57	51.05	28.1	29.68	28.08	28.1	21.11	59.50	28.1	10.62	17.63
29.0	5.49	27.38	29.1	47.47	50.63	29.1	29.62	27.70	29.1	20.88	59.33	29.1	10.49	17.30
30.0	5.49	26.96	30.1	47.38	50.23	30.1	29.57	27.31	30.1	20.61	59.18	30.1	10.38	16.98
31.0	5.51	26.56	31.1	47.33	49.81	31.1	29.54	26.92	31.1	20.33	59.03	31.1	10.29	16.64
32.0	5.54	26.17	32.1	47.31	49.41	32.1	29.53	26.52	32.1	20.02	58.85	32.1	10.20	16.28
	8.33	−8.27		15.92	−15.89		7.03	−6.96		18.20	+18.17		7.65	−7.58
21^h	38^m	$10^s.025$	22^h	15^m	$56^s.333$	22^h	37^m	$32^s.703$	23^h	27^m	$44^s.392$	23^h	47^m	$12^s.813$
−83°	6′	23″.31	−86°	23′	45″.22	−81°	49′	21″.11	+86°	50′	39″.03	−82°	29′	8″.43

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			α **Ursæ Minoris.** (*Polaris.*) Mag. 2.1			**4 G. Octantis.** Mag. 5.6			**Groombridge 750.** Mag. 6.7			**Groombridge 944.** Mag. 6.4		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Feb.	0 56	+85 48	Feb.	1 28	+88 51	Feb.	1 41	−85 11	Feb.	4 9	+85 20	Feb.	5 35	+85 9
	s	″		s	″		s	″		s	″		s	″
0.2	52.30	52.14	0.2	79.77	52.99	0.2	65.14	50.09	0.3	56.09	26.97	0.4	11.71	47.77
1.2	52.03	52.08	1.2	78.73	52.99	1.2	64.89	49.87	1.3	55.91	27.16	1.4	11.59	48.04
2.2	51.74	52.00	2.2	77.61	52.94	2.2	64.66	49.65	2.3	55.69	27.35	2.4	11.45	48.31
3.2	51.44	51.90	3.2	76.44	52.89	3.2	64.43	49.45	3.3	55.46	27.52	3.4	11.29	48.58
4.2	51.14	51.77	4.2	75.26	52.82	4.2	64.20	49.27	4.3	55.19	27.68	4.4	11.11	48.85
5.2	50.85	51.61	5.2	74.11	52.72	5.2	63.98	49.09	5.3	54.93	27.83	5.4	10.91	49.09
6.2	50.57	51.42	6.2	73.02	52.58	6.2	63.74	48.94	6.3	54.65	27.92	6.4	10.71	49.29
7.2	50.32	51.22	7.2	72.01	52.44	7.2	63.48	48.79	7.3	54.40	28.00	7.4	10.50	49.48
8.2	50.08	51.03	8.2	71.09	52.31	8.2	63.21	48.64	8.3	54.16	28.05	8.3	10.29	49.64
9.2	49.88	50.84	9.2	70.22	52.16	9.2	62.93	48.47	9.3	53.93	28.09	9.3	10.10	49.79
10.2	49.68	50.66	10.2	69.38	52.01	10.2	62.65	48.28	10.3	53.70	28.14	10.3	9.91	49.94
11.1	49.49	50.50	11.2	68.55	51.89	11.2	62.38	48.07	11.3	53.49	28.20	11.3	9.75	50.08
12.1	49.29	50.34	12.2	67.71	51.75	12.2	62.10	47.85	12.3	53.28	28.26	12.3	9.58	50.24
13.1	49.08	50.19	13.2	66.83	51.65	13.2	61.86	47.59	13.3	53.06	28.35	13.3	9.41	50.41
14.1	48.85	50.03	14.2	65.91	51.52	14.2	61.62	47.35	14.3	52.84	28.43	14.3	9.25	50.60
15.1	48.61	49.85	15.2	64.95	51.40	15.2	61.39	47.08	15.3	52.61	28.54	15.3	9.07	50.80
16.1	48.37	49.68	16.2	63.95	51.26	16.2	61.17	46.80	16.3	52.36	28.62	16.3	8.87	50.99
17.1	48.13	49.50	17.2	62.93	51.14	17.2	60.98	46.56	17.3	52.10	28.69	17.3	8.66	51.18
18.1	47.88	49.29	18.2	61.90	50.97	18.2	60.78	46.31	18.3	51.83	28.76	18.3	8.43	51.37
19.1	47.63	49.06	19.1	60.89	50.77	19.2	60.58	46.06	19.3	51.54	28.81	19.3	8.19	51.55
20.1	47.38	48.82	20.1	59.91	50.57	20.2	60.37	45.83	20.3	51.25	28.82	20.3	7.98	51.69
21.1	47.18	48.55	21.1	59.01	50.34	21.2	60.15	45.61	21.3	50.96	28.83	21.3	7.70	51.79
22.1	46.98	48.28	22.1	58.19	50.09	22.2	59.92	45.38	22.3	50.69	28.80	22.3	7.42	51.87
23.1	46.82	48.02	23.1	57.47	49.87	23.1	59.68	45.15	23.2	50.45	28.76	23.3	7.20	51.97
24.1	46.67	47.77	24.1	56.82	49.64	24.1	59.43	44.92	24.2	50.22	28.72	24.3	6.98	52.04
25.1	46.54	47.54	25.1	56.21	49.45	25.1	59.18	44.64	25.2	50.00	28.67	25.3	6.79	52.11
26.1	46.41	47.33	26.1	55.57	49.26	26.1	58.93	44.31	26.2	49.80	28.67	26.3	6.60	52.18
27.1	46.26	47.15	27.1	54.90	49.08	27.1	58.70	43.99	27.2	49.60	28.65	27.3	6.42	52.28
28.1	46.09	46.95	28.1	54.16	48.94	28.1	58.51	43.65	28.2	49.37	28.69	28.3	6.23	52.39
29.1	45.92	46.74	29.1	53.35	48.77	29.1	58.32	43.31	29.2	49.15	28.69	29.3	6.04	52.52
30.1	45.72	46.51	30.1	52.50	48.57	30.1	58.17	42.99	30.2	48.88	28.71	30.3	5.81	52.65
31.1	45.51	46.26	31.1	51.63	48.34	31.1	58.01	42.66	31.2	48.62	28.70	31.3	5.57	52.78
	13.70	+13.66		50.45	+50.44		11.94	−11.90		12.31	+12.27		11.86	+11.82
	$0^h\ 57^m$	$1^s.657$		$1^h\ 29^m$	$44^s.254$		$1^h\ 42^m$	$6^s.102$		$4^h\ 9^m$	$44^s.952$		$5^h\ 34^m$	$54^s.014$
	+85° 48′	25″.87		+88° 51′	25″.03		−85° 11′	39″.58		+85° 20′	1″.04		+85° 9′	28″.07

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Mensæ. Mag. 6.2			ζ Mensæ. Mag. 5.6			51 H. Cephei. Mag. 5.3			25 H. Camelop. Mag. 5.1			7 G. Octantis. Mag. 6.4		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Feb.	5 46	−84 49	Feb.	6 47	−80 43	Feb.	7 2	+87 11	Feb.	7 13	+82 34	Feb.	7 16	−86 54
	s	″		s	″		s	″		s	″		s	″
0.4	33.18	55.82	0.4	8.47	39.94	0.4	12.56	10.87	0.4	44.78	45.40	0.4	53.69	4.25
1.4	32.93	56.01	1.4	8.37	40.22	1.4	12.51	11.19	1.4	44.77	45.72	1.4	53.37	4.55
2.4	32.69	56.20	2.4	8.27	40.49	2.4	12.43	11.52	2.4	44.76	46.04	2.4	53.08	4.84
3.4	32.46	56.35	3.4	8.16	40.73	3.4	12.31	11.86	3.4	44.73	46.38	3.4	52.80	5.12
4.4	32.24	56.52	4.4	8.06	40.97	4.4	12.15	12.19	4.4	44.68	46.71	4.4	52.53	5.38
5.4	32.03	56.71	5.4	7.97	41.24	5.4	11.94	12.50	5.4	44.62	47.01	5.4	52.29	5.66
6.4	31.81	56.92	6.4	7.87	41.51	6.4	11.71	12.79	6.4	44.53	47.30	6.4	52.05	5.97
7.4	31.59	57.14	7.4	7.79	41.82	7.4	11.48	13.06	7.4	44.44	47.57	7.4	51.82	6.28
8.4	31.37	57.36	8.4	7.69	42.13	8.4	11.23	13.31	8.4	44.37	47.81	8.4	51.57	6.61
9.4	31.14	57.59	9.4	7.58	42.44	9.4	11.00	13.56	9.4	44.29	48.04	9.4	51.30	6.96
10.4	30.89	57.81	10.4	7.48	42.76	10.4	10.79	13.78	10.4	44.22	48.27	10.4	51.02	7.30
11.3	30.62	58.04	11.4	7.37	43.08	11.4	10.59	14.01	11.4	44.17	48.49	11.4	50.71	7.63
12.3	30.35	58.24	12.4	7.24	43.36	12.4	10.41	14.24	12.4	44.11	48.73	12.4	50.38	7.95
13.3	30.08	58.40	13.4	7.12	43.62	13.4	10.22	14.49	13.4	44.05	48.97	13.4	50.03	8.25
14.3	29.81	58.55	14.4	7.00	43.87	14.4	10.04	14.76	14.4	44.00	49.24	14.4	49.67	8.54
15.3	29.54	58.70	15.4	6.87	44.10	15.4	9.84	15.02	15.4	43.94	49.50	15.4	49.31	8.81
16.3	29.27	58.81	16.4	6.74	44.31	16.4	9.62	15.30	16.4	43.86	49.79	16.4	48.95	9.05
17.3	29.02	58.91	17.4	6.62	44.51	17.4	9.39	15.59	17.4	43.78	50.08	17.4	48.60	9.29
18.3	28.77	59.02	18.4	6.50	44.71	18.4	9.11	15.87	18.4	43.70	50.35	18.4	48.26	9.54
19.3	28.52	59.13	19.4	6.38	44.91	19.4	8.80	16.14	19.4	43.59	50.63	19.4	47.93	9.77
20.3	28.28	59.26	20.4	6.26	45.13	20.4	8.48	16.39	20.4	43.47	50.87	20.4	47.61	10.02
21.3	28.04	59.41	21.4	6.16	45.36	21.4	8.14	16.62	21.4	43.34	51.12	21.4	47.29	10.26
22.3	27.78	59.55	22.4	6.03	45.60	22.4	7.79	16.81	22.4	43.22	51.32	22.4	46.98	10.54
23.3	27.51	59.73	23.4	5.90	45.85	23.4	7.45	17.01	23.4	43.09	51.52	23.4	46.65	10.83
24.3	27.24	59.89	24.4	5.78	46.11	24.4	7.13	17.17	24.4	43.00	51.69	24.4	46.29	11.13
25.3	26.95	60.03	25.4	5.64	46.36	25.4	6.85	17.32	25.4	42.89	51.84	25.4	45.91	11.42
26.3	26.66	60.13	26.4	5.50	46.61	26.4	6.60	17.49	26.4	42.80	52.01	26.4	45.49	11.71
27.3	26.34	60.26	27.3	5.35	46.81	27.4	6.35	17.68	27.4	42.72	52.20	27.4	45.06	11.95
28.3	26.03	60.35	28.3	5.20	46.99	28.4	6.11	17.87	28.4	42.65	52.42	28.4	44.60	12.19
29.3	25.74	60.39	29.3	5.05	47.15	29.4	5.84	18.10	29.4	42.57	52.64	29.4	44.17	12.38
30.3	25.45	60.41	30.3	4.90	47.29	30.3	5.54	18.33	30.4	42.47	52.88	30.4	43.73	12.55
31.3	25.17	60.44	31.3	4.76	47.42	31.3	5.21	18.56	31.4	42.34	53.11	31.4	43.32	12.73
	11.10	−11.06		6.21	−6.13		20.38	+20.36		7.74	+7.68		18.51	−18.48
	5^{h} 46^{m}	$26^{s}.439$		6^{h} 47^{m}	$3^{s}.489$		7^{h} 1^{m}	$34^{s}.861$		7^{h} 13^{m}	$29^{s}.477$		7^{h} 16^{m}	$40^{s}.555$
−84°	49′	48″.17	−80°	43′	34″.16	+87°	11′	0″.11	+82°	34′	36″.50	−86°	54′	0″.14

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

roombridge 1119. Mag. 7.0			ζ Octantis. Mag. 5.4			1 H. Draconis. Mag. 4.6			ζ Chamæleontis. Mag. 5.2			30 H. Camelop. Mag. 5.3		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Feb.	8 16	+88 53	Feb.	9 9	−85 19	Feb.	9 25	+81 41	Feb.	9 36	−80 33	Feb.	10 21	+82 58
	s	″		s	″		s	″		s	″		s	″
0.5	29.13	13.30	0.5	15.73	42.05	0.5	27.13	49.64	0.5	29.33	49.17	0.6	12.49	58.28
1.5	29.33	13.62	1.5	15.68	42.44	1.5	27.21	49.92	1.5	29.34	49.59	1.6	12.62	58.51
2.5	29.49	13.96	2.5	15.61	42.82	2.5	27.29	50.22	2.5	29.33	49.97	2.6	12.76	58.77
3.5	29.56	14.32	3.5	15.56	43.19	3.5	27.35	50.54	3.5	29.32	50.35	3.6	12.87	59.05
4.5	29.53	14.68	4.5	15.51	43.52	4.5	27.40	50.86	4.5	29.32	50.72	4.6	12.97	59.34
5.5	29.38	15.02	5.5	15.47	43.88	5.5	27.43	51.19	5.5	29.31	51.07	5.6	13.06	59.64
6.5	29.16	15.36	6.5	15.45	44.24	6.5	27.45	51.51	6.5	29.32	51.44	6.6	13.12	59.95
7.5	28.88	15.67	7.5	15.43	44.61	7.5	27.45	51.81	7.5	29.33	51.80	7.6	13.18	60.25
8.5	28.58	15.95	8.5	15.42	45.00	8.5	27.46	52.11	8.5	29.35	52.20	8.5	13.22	60.53
9.5	28.28	16.23	9.5	15.40	45.42	9.5	27.47	52.39	9.5	29.36	52.61	9.5	13.26	60.80
10.5	28.02	16.51	10.5	15.35	45.83	10.5	27.47	52.66	10.5	29.37	53.03	10.5	13.31	61.07
11.5	27.78	16.78	11.5	15.31	46.26	11.5	27.50	52.93	11.5	29.37	53.45	11.5	13.37	61.31
12.4	27.58	17.05	12.5	15.24	46.65	12.5	27.52	53.20	12.5	29.36	53.88	12.5	13.43	61.58
13.4	27.40	17.33	13.5	15.15	47.06	13.5	27.54	53.47	13.5	29.35	54.30	13.5	13.51	61.85
14.4	27.22	17.62	14.5	15.06	47.45	14.5	27.57	53.76	14.5	29.33	54.72	14.5	13.57	62.13
15.4	27.03	17.94	15.5	14.95	47.83	15.5	27.59	54.06	15.5	29.30	55.11	15.5	13.64	62.41
16.4	26.81	18.27	16.5	14.84	48.20	16.5	27.62	54.38	16.5	29.26	55.50	16.5	13.71	62.70
17.4	26.54	18.59	17.5	14.72	48.55	17.5	27.64	54.70	17.5	29.23	55.87	17.5	13.77	63.02
18.4	26.18	18.93	18.5	14.61	48.88	18.5	27.64	55.02	18.5	29.19	56.22	18.5	13.82	63.35
19.4	25.74	19.28	19.5	14.51	49.21	19.5	27.64	55.36	19.5	29.16	56.59	19.5	13.86	63.67
20.4	25.25	19.59	20.5	14.42	49.54	20.5	27.62	55.70	20.5	29.13	56.93	20.5	13.87	64.02
21.4	24.66	19.88	21.5	14.32	49.90	21.5	27.58	56.03	21.5	29.11	57.29	21.5	13.88	64.36
22.4	24.06	20.17	22.5	14.25	50.26	22.5	27.54	56.33	22.5	29.09	57.66	22.5	13.88	64.68
23.4	23.45	20.41	23.5	14.17	50.63	23.5	27.51	56.61	23.5	29.07	58.07	23.5	13.88	64.98
24.4	22.87	20.65	24.5	14.08	51.05	24.5	27.47	56.87	24.5	29.05	58.48	24.5	13.88	65.26
25.4	22.36	20.87	25.5	13.98	51.46	25.5	27.46	57.12	25.5	29.02	58.91	25.5	13.87	65.53
26.4	21.92	21.09	26.4	13.84	51.88	26.5	27.44	57.37	26.5	28.98	59.33	26.5	13.88	65.77
27.4	21.52	21.33	27.4	13.69	52.27	27.5	27.43	57.63	27.5	28.93	59.77	27.5	13.91	66.04
28.4	21.14	21.58	28.4	13.51	52.65	28.5	27.42	57.91	28.5	28.87	60.16	28.5	13.95	66.31
29.4	20.72	21.87	29.4	13.33	53.00	29.5	27.42	58.19	29.5	28.81	60.54	29.5	13.98	66.59
30.4	20.25	22.15	30.4	13.15	53.32	30.4	27.41	58.51	30.5	28.74	60.90	30.5	14.00	66.90
31.4	19.68	22.45	31.4	12.98	53.64	31.4	27.37	58.83	31.5	28.67	61.22	31.5	14.01	67.25
	51.54	+51.53		12.28	−12.24		6.93	+6.85		6.10	−6.02		8.19	+8.13
8^h	14^m	$48^s.311$	9^h	9^m	$6^s.085$	9^h	25^m	$12^s.930$	9^h	36^m	$24^s.003$	10^h	20^m	$57^s.259$
+88°	53′	11″.43	−85°	19′	42″.77	+81°	41′	57″.18	−80°	33′	50″.61	+82°	59′	12″.27

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

η Octantis. Mag. 6.3			Bradley 1672. Mag. 6.3			*ι* Octantis. Mag. 5.4			32 H. Camelop. *seq.* Mag. 5.3			*κ* Octantis. Mag. 5.6		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Feb.	11 0	−84 8	Feb.	12 15	+88 9	Feb.	12 46	−84 39	Feb.	12 48	+83 51	Feb.	13 27	−85 21
	s	″		s	″		s	″		s	″		s	″
0.6	2.45	26.04	0.6	3.24	31.81	0.7	6.05	54.26	0.7	39.03	43.35	0.7	9.52	14.29
1.6	2.54	26.42	1.6	3.88	31.90	1.7	6.25	54.57	1.7	39.25	43.41	1.7	9.81	14.54
2.6	2.62	26.80	2.6	4.55	32.04	2.7	6.44	54.86	2.7	39.47	43.50	2.7	10.04	14.79
3.6	2.68	27.14	3.6	5.22	32.21	3.7	6.62	55.14	3.7	39.68	43.61	3.7	10.29	15.03
4.6	2.76	27.49	4.6	5.85	32.40	4.7	6.79	55.40	4.7	39.89	43.75	4.7	10.51	15.22
5.6	2.84	27.82	5.6	6.46	32.61	5.7	6.97	55.63	5.7	40.09	43.92	5.7	10.76	15.42
6.6	2.92	28.15	6.6	6.97	32.83	6.7	7.17	55.87	6.7	40.27	44.10	6.7	11.02	15.61
7.6	3.03	28.51	7.6	7.45	33.06	7.7	7.37	56.12	7.7	40.44	44.26	7.7	11.29	15.78
8.6	3.13	28.88	8.6	7.87	33.30	8.6	7.60	56.36	8.7	40.59	44.44	8.7	11.56	15.98
9.6	3.25	29.25	9.6	8.29	33.49	9.6	7.83	56.64	9.6	40.73	44.61	9.7	11.86	16.21
10.6	3.34	29.65	10.6	8.70	33.69	10.6	8.06	56.95	10.6	40.89	44.78	10.7	12.15	16.44
11.6	3.43	30.06	11.6	9.13	33.89	11.6	8.28	57.26	11.6	41.04	44.93	11.7	12.45	16.72
12.6	3.52	30.46	12.6	9.58	34.08	12.6	8.48	57.58	12.6	41.20	45.08	12.7	12.72	16.98
13.6	3.58	30.88	13.6	10.04	34.27	13.6	8.67	57.92	13.6	41.36	45.23	13.7	13.00	17.26
14.6	3.63	31.29	14.6	10.54	34.49	14.6	8.86	58.25	14.6	41.54	45.39	14.7	13.24	17.56
15.6	3.68	31.70	15.6	11.05	34.67	15.6	9.03	58.60	15.6	41.72	45.54	15.7	13.48	17.85
16.6	3.71	32.09	16.6	11.57	34.90	16.6	9.18	58.94	16.6	41.90	45.72	16.7	13.70	18.15
17.6	3.74	32.48	17.6	12.08	35.14	17.6	9.32	59.27	17.6	42.08	45.91	17.7	13.91	18.44
18.5	3.76	32.84	18.6	12.57	35.42	18.6	9.46	59.58	18.6	42.25	46.14	18.7	14.11	18.71
19.5	3.79	33.20	19.6	13.04	35.68	19.6	9.59	59.89	19.6	42.41	46.36	19.6	14.30	18.95
20.5	3.82	33.56	20.6	13.46	35.95	20.6	9.74	60.19	20.6	42.56	46.61	20.6	14.52	19.21
21.5	3.86	33.92	21.6	13.81	36.24	21.6	9.91	60.48	21.6	42.69	46.87	21.6	14.74	19.46
22.5	3.92	34.29	22.6	14.11	36.54	22.6	10.08	60.77	22.6	42.81	47.14	22.6	14.98	19.72
23.5	3.98	34.67	23.6	14.39	36.81	23.6	10.26	61.09	23.6	42.92	47.38	23.6	15.23	19.99
24.5	4.04	35.09	24.6	14.62	37.10	24.6	10.45	61.43	24.6	43.03	47.63	24.6	15.50	20.28
25.5	4.09	35.53	25.6	14.89	37.32	25.6	10.64	61.80	25.6	43.13	47.82	25.6	15.76	20.59
26.5	4.12	35.98	26.6	15.17	37.56	26.6	10.82	62.17	26.6	43.26	48.03	26.6	16.01	20.92
27.5	4.14	36.42	27.6	15.49	37.78	27.6	10.98	62.59	27.6	43.38	48.22	27.6	16.25	21.30
28.5	4.13	36.86	28.6	15.85	38.02	28.6	11.11	62.98	28.6	43.51	48.42	28.6	16.45	21.66
29.5	4.11	37.29	29.6	16.24	38.26	29.6	11.22	63.37	29.6	43.66	48.63	29.6	16.63	22.02
30.5	4.09	37.68	30.6	16.63	38.54	30.6	11.32	63.75	30.6	43.80	48.87	30.6	16.81	22.37
31.5	4.07	38.06	31.6	17.00	38.84	31.6	11.41	64.11	31.6	43.94	49.14	31.6	16.96	22.70
	9.80	−9.75		31.14	+31.12		10.76	−10.71		9.35	+9.30		12.35	−12.31
10^{h}	59^{m}	$55^{s}.642$	12^{h}	14^{m}	$28^{s}.053$	12^{h}	46^{m}	$1^{s}.183$	12^{h}	48^{m}	$29^{s}.976$	13^{h}	27^{m}	$5^{s}.514$
−84°	8′	31″.24	+88°	9′	56″.03	−84°	40′	2″.72	+83°	52′	10″.05	−85°	21′	23″.59

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			Groombridge 2283. Mag. 7.2			ρ Octantis. Mag. 5.7			ε Ursæ Minoris. Mag. 4.4			59 G. Apodis. Mag. 5.9		
ash. ean ime.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Feb.	14 13	−83 16	Feb.	15 3	+87 32	Feb.	15 23	−84 11	Feb.	16 54	+82 10	Feb.	17 15	−80 46
	s	″		s	″		s	″		s	″		s	″
0.7	20.51	54.74	0.8	55.42	55.37	0.8	43.28	8.22	0.8	24.64	14.13	0.9	42.24	55.50
1.7	20.73	54.94	1.8	55.91	55.26	1.8	43.55	8.30	1.8	24.76	13.87	1.9	42.41	55.39
2.7	20.93	55.13	2.8	56.45	55.15	2.8	43.80	8.38	2.8	24.89	13.62	2.9	42.57	55.30
3.7	21.12	55.30	3.8	57.00	55.06	3.8	44.05	8.45	3.8	25.02	13.37	3.8	42.72	55.21
4.7	21.31	55.46	4.8	57.56	55.00	4.8	44.28	8.49	4.8	25.17	13.15	4.8	42.86	55.10
5.7	21.49	55.60	5.8	58.12	54.97	5.8	44.50	8.53	5.8	25.33	12.94	5.8	42.99	54.98
6.7	21.69	55.73	6.8	58.65	54.96	6.8	44.73	8.54	6.8	25.47	12.78	6.8	43.13	54.84
7.7	21.89	55.85	7.7	59.15	54.97	7.8	44.99	8.56	7.8	25.62	12.63	7.8	43.27	54.68
8.7	22.11	56.00	8.7	59.63	55.00	8.8	45.25	8.58	8.8	25.75	12.50	8.8	43.42	54.52
9.7	22.33	56.12	9.7	60.09	55.02	9.8	45.53	8.61	9.8	25.91	12.37	9.8	43.58	54.36
10.7	22.56	56.29	10.7	60.54	55.04	10.8	45.81	8.65	10.8	26.04	12.25	10.8	43.75	54.21
11.7	22.79	56.46	11.7	60.99	55.05	11.8	46.09	8.72	11.8	26.18	12.13	11.8	43.92	54.09
12.7	23.01	56.68	12.7	61.44	55.04	12.7	46.38	8.80	12.8	26.31	11.99	12.8	44.10	53.97
13.7	23.23	56.90	13.7	61.91	55.03	13.7	46.66	8.90	13.8	26.45	11.83	13.8	44.29	53.87
14.7	23.44	57.14	14.7	62.41	55.02	14.7	46.93	9.02	14.8	26.59	11.68	14.8	44.46	53.82
15.7	23.63	57.38	15.7	62.92	55.01	15.7	47.18	9.15	15.8	26.74	11.51	15.8	44.63	53.75
16.7	23.81	57.61	16.7	63.45	55.01	16.7	47.43	9.28	16.8	26.90	11.35	16.8	44.80	53.71
17.7	23.99	57.84	17.7	63.99	55.03	17.7	47.67	9.41	17.8	27.06	11.20	17.8	44.96	53.67
18.7	24.16	58.06	18.7	64.54	55.06	18.7	47.90	9.55	18.8	27.23	11.06	18.8	45.11	53.64
19.7	24.33	58.27	19.7	65.09	55.12	19.7	48.12	9.66	19.8	27.40	10.95	19.8	45.25	53.59
20.7	24.50	58.46	20.7	65.62	55.20	20.7	48.35	9.77	20.8	27.56	10.86	20.8	45.40	53.51
21.7	24.68	58.65	21.7	66.13	55.30	21.7	48.58	9.84	21.8	27.73	10.80	21.8	45.55	53.42
22.7	24.87	58.85	22.7	66.60	55.42	22.7	48.83	9.92	22.8	27.89	10.76	22.8	45.71	53.34
23.7	25.08	59.06	23.7	67.04	55.54	23.7	49.10	10.02	23.8	28.05	10.74	23.8	45.88	53.24
24.7	25.29	59.29	24.7	67.47	55.65	24.7	49.37	10.13	24.8	28.20	10.71	24.8	46.05	53.14
25.7	25.50	59.54	25.7	67.87	55.74	25.7	49.66	10.26	25.8	28.34	10.67	25.8	46.24	53.07
26.7	25.71	59.81	26.7	68.27	55.81	26.7	49.95	10.41	26.8	28.49	10.62	26.8	46.44	53.02
27.7	25.92	60.12	27.7	68.69	55.88	27.7	50.23	10.60	27.8	28.62	10.54	27.8	46.64	53.00
28.7	26.11	60.43	28.7	69.14	55.94	28.7	50.50	10.82	28.8	28.76	10.46	28.8	46.83	53.02
29.7	26.27	60.75	29.7	69.63	56.00	29.7	50.74	11.03	29.8	28.93	10.37	29.8	47.02	53.03
30.6	26.42	61.04	30.7	70.14	56.08	30.7	50.96	11.24	30.8	29.10	10.30	30.8	47.18	53.06
31.6	26.57	61.33	31.7	70.65	56.19	31.7	51.18	11.42	31.8	29.27	10.23	31.8	47.34	53.11
8.55		−8.49	23.38		+23.36	9.87		−9.82	7.34		+7.27	6.24		−6.16
$14^{h}\ 13^{m}\ 18^{s}.531$			$15^{h}\ 4^{m}\ 0^{s}.607$			$15^{h}\ 23^{m}\ 43^{s}.237$			$16^{h}\ 54^{m}\ 31^{s}.741$			$17^{h}\ 15^{m}\ 43^{s}.730$		
−83° 17′ 4″.27			+87° 33′ 24″.43			−84° 11′ 17″.84			+82° 10′ 38″.40			−80° 47′ 2″.69		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Ursæ Minoris. Mag. 4.4			**χ Octantis.** Mag. 5.2			**λ Ursæ Minoris.** Mag. 6.6			**σ Octantis.** Mag. 5.5			**76 Draconis.** Mag. 5.7		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Feb.	17 58	+86 36	Feb.	18 5	−87 39	Feb.	19 2	+89 0	Feb.	19 25	−89 13	Feb.	20 48	+82 13
	s	″		s	″		s	″		s	″		s	″
0.9	56.17	32.87	0.9	24.37	45.76	0.9	8.24	45.54	0.9	20.40	32.46	1.0	31.54	17.70
1.9	56.35	32.55	1.9	24.93	45.57	1.9	8.47	45.21	1.9	21.64	32.15	2.0	31.51	17.36
2.9	56.55	32.24	2.9	25.47	45.38	2.9	8.78	44.87	2.9	22.83	31.87	2.9	31.49	17.01
3.9	56.78	31.94	3.9	25.98	45.19	3.9	9.22	44.52	3.9	23.93	31.59	3.9	31.47	16.65
4.9	57.04	31.65	4.9	26.45	45.02	4.9	9.76	44.19	4.9	24.91	31.31	4.9	31.46	16.28
5.9	57.31	31.39	5.9	26.90	44.81	5.9	10.39	43.89	5.9	25.84	31.03	5.9	31.47	15.93
6.9	57.59	31.16	6.9	27.35	44.58	6.9	11.08	43.60	6.9	26.72	30.73	6.9	31.50	15.59
7.9	57.87	30.93	7.9	27.81	44.34	7.9	11.78	43.32	7.9	27.63	30.41	7.9	31.52	15.26
8.9	58.14	30.74	8.9	28.31	44.09	8.9	12.48	43.07	8.9	28.63	30.08	8.9	31.55	14.94
9.9	58.40	30.56	9.9	28.84	43.84	9.9	13.14	42.83	9.9	29.71	29.74	9.9	31.58	14.64
10.9	58.65	30.37	10.9	29.40	43.60	10.9	13.76	42.59	10.9	30.88	29.41	10.9	31.61	14.35
11.9	58.91	30.19	11.9	30.00	43.37	11.9	14.35	42.35	11.9	32.15	29.08	11.9	31.64	14.07
12.9	59.15	29.98	12.9	30.60	43.16	12.9	14.92	42.10	12.9	33.50	28.76	12.9	31.66	13.77
13.8	59.40	29.77	13.9	31.23	42.97	13.9	15.50	41.84	13.9	34.92	28.44	13.9	31.68	13.46
14.8	59.67	29.55	14.9	31.85	42.82	14.9	16.09	41.57	14.9	36.36	28.16	14.9	31.70	13.14
15.8	59.94	29.32	15.8	32.45	42.67	15.9	16.71	41.28	15.9	37.82	27.89	15.9	31.72	12.82
16.8	60.21	29.09	16.8	33.04	42.53	16.9	17.39	41.01	16.9	39.24	27.64	16.9	31.74	12.48
17.8	60.52	28.85	17.8	33.61	42.40	17.9	18.13	40.73	17.9	40.62	27.39	17.9	31.77	12.15
18.8	60.84	28.62	18.8	34.17	42.28	18.9	18.96	40.45	18.9	41.95	27.15	18.9	31.80	11.78
19.8	61.18	28.43	19.8	34.69	42.16	19.9	19.87	40.20	19.9	43.20	26.92	19.9	31.85	11.44
20.8	61.52	28.26	20.8	35.20	42.00	20.9	20.83	39.96	20.9	44.41	26.66	20.9	31.90	11.09
21.8	61.87	28.11	21.8	35.74	41.82	21.9	21.82	39.73	21.9	45.63	26.38	21.9	31.97	10.76
22.8	62.21	27.97	22.8	36.29	41.65	22.9	22.81	39.52	22.9	46.87	26.10	22.9	32.04	10.46
23.8	62.54	27.87	23.8	36.88	41.45	23.9	23.77	39.33	23.9	48.20	25.80	23.9	32.12	10.19
24.8	62.84	27.78	24.8	37.51	41.27	24.9	24.66	39.17	24.9	49.66	25.50	24.9	32.20	9.98
25.8	63.13	27.66	25.8	38.19	41.11	25.9	25.48	38.98	25.9	51.26	25.21	25.9	32.26	9.[illegible]
26.8	63.42	27.54	26.8	38.89	40.96	26.9	26.24	38.80	26.9	52.98	24.94	26.9	32.32	9.44
27.8	63.70	27.40	27.8	39.61	40.85	27.9	26.98	38.60	27.9	54.77	24.68	27.9	32.38	9.15
28.8	63.98	27.24	28.8	40.31	40.78	28.9	27.75	38.38	28.9	56.58	24.44	28.9	32.43	8.[illegible]
29.8	64.30	27.09	29.8	40.97	40.72	29.9	28.58	38.16	29.9	58.35	24.24	29.9	32.48	8.58
30.8	64.63	26.95	30.8	41.61	40.67	30.9	29.49	37.93	30.9	60.04	24.05	30.9	32.54	8.29
31.8	64.99	26.77	31.8	42.21	40.60	31.8	30.51	37.72	31.9	61.61	23.86	31.9	32.62	7.94
	16.90	+16.87		24.51	−24.49		57.96	+57.95		73.88	−73.87		7.39	+7.32
$17^h\ 59^m\ 20^s.805$			$18^h\ 5^m\ 36^s.163$			$19^h\ 3^m\ 51^s.560$			$19^h\ 26^m\ 7^s.189$			$20^h\ 48^m\ 44^s.6$[illegible]		
+86° 36′ 51″.19			−87° 39′ 52″.21			+89° 0′ 56″.70			−89° 13′ 35″.99			+82° 13′ 16″.35		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			υ Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ¹ Octantis. Mag. 5.1		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Feb.	21 38	−83 6	Feb.	22 15	−86 23	Feb.	22 37	−81 49	Feb.	23 27	+86 50	Feb.	23 47	−82 29
	s	″		s	″		s	″		s	″		s	″
1.0	5.54	26.17	1.1	47.31	49.41	1.1	29.53	26.52	1.1	20.02	58.85	1.1	10.20	16.28
2.0	5.58	25.81	2.1	47.30	49.04	2.1	29.52	26.16	2.1	19.70	58.66	2.1	10.12	15.94
3.0	5.62	25.46	3.1	47.29	48.66	3.1	29.51	25.82	3.1	19.38	58.44	3.1	10.06	15.62
4.0	5.64	25.12	4.1	47.27	48.32	4.1	29.48	25.49	4.1	19.06	58.18	4.1	9.99	15.33
5.0	5.66	24.81	5.1	47.22	47.98	5.1	29.44	25.16	5.1	18.77	57.91	5.1	9.90	15.05
6.0	5.66	24.48	6.0	47.17	47.67	6.1	29.41	24.86	6.1	18.51	57.64	6.1	9.81	14.76
7.0	5.65	24.13	7.0	47.08	47.31	7.1	29.35	24.54	7.1	18.29	57.35	7.1	9.71	14.49
8.0	5.64	23.76	8.0	47.00	46.94	8.1	29.30	24.20	8.1	18.08	57.08	8.1	9.60	14.21
9.0	5.64	23.39	9.0	46.91	46.58	9.1	29.25	23.83	9.1	17.90	56.81	9.1	9.48	13.90
10.0	5.63	22.98	10.0	46.84	46.19	10.1	29.20	23.46	10.1	17.74	56.55	10.1	9.38	13.57
11.0	5.65	22.57	11.0	46.79	45.75	11.1	29.17	23.06	11.1	17.57	56.31	11.1	9.28	13.21
12.0	5.69	22.16	12.0	46.77	45.34	12.0	29.15	22.67	12.1	17.39	56.08	12.1	9.19	12.86
13.0	5.73	21.76	13.0	46.76	44.92	13.0	29.14	22.27	13.1	17.21	55.84	13.1	9.12	12.51
14.0	5.78	21.36	14.0	46.79	44.51	14.0	29.14	21.87	14.1	17.00	55.59	14.1	9.06	12.14
15.0	5.84	20.99	15.0	46.83	44.12	15.0	29.14	21.48	15.1	16.78	55.35	15.1	8.99	11.76
15.9	5.91	20.61	16.0	46.87	43.74	16.0	29.15	21.09	16.1	16.56	55.08	16.1	8.94	11.39
16.9	5.97	20.27	17.0	46.92	43.37	17.0	29.16	20.73	17.1	16.34	54.81	17.1	8.90	11.06
17.9	6.04	19.93	18.0	46.98	43.01	18.0	29.17	20.39	18.1	16.11	54.51	18.1	8.85	10.71
18.9	6.09	19.59	19.0	47.02	42.69	19.0	29.17	20.04	19.1	15.91	54.21	19.1	8.81	10.39
19.9	6.15	19.25	20.0	47.04	42.32	20.0	29.17	19.70	20.1	15.73	53.89	20.1	8.75	10.06
20.9	6.19	18.92	21.0	47.05	41.97	21.0	29.16	19.36	21.1	15.59	53.56	21.1	8.68	9.74
21.9	6.22	18.56	22.0	47.05	41.61	22.0	29.15	19.00	22.1	15.48	53.22	22.1	8.61	9.42
22.9	6.25	18.19	23.0	47.04	41.23	23.0	29.13	18.62	23.1	15.39	52.90	23.1	8.52	9.09
23.9	6.29	17.80	24.0	47.05	40.83	24.0	29.11	18.22	24.0	15.33	52.62	24.1	8.44	8.72
24.9	6.34	17.38	24.9	47.07	40.41	25.0	29.11	17.80	25.0	15.27	52.35	25.1	8.38	8.31
25.9	6.42	16.97	25.9	47.11	39.97	26.0	29.12	17.38	26.0	15.19	52.10	26.1	8.33	7.90
26.9	6.51	16.56	26.9	47.20	39.52	27.0	29.15	16.93	27.0	15.10	51.84	27.1	8.29	7.48
27.9	6.61	16.14	27.9	47.32	39.08	28.0	29.20	16.52	28.0	14.98	51.60	28.1	8.27	7.06
28.9	6.72	15.77	28.9	47.48	38.69	29.0	29.25	16.11	29.0	14.85	51.33	29.1	8.26	6.65
29.9	6.84	15.42	29.9	47.61	38.32	30.0	29.29	15.73	30.0	14.71	51.03	30.0	8.25	6.26
30.9	6.95	15.09	30.9	47.75	37.99	30.9	29.34	15.38	31.0	14.57	50.71	31.0	8.25	5.88
31.9	7.04	14.77	31.9	47.87	37.65	31.9	29.38	15.04	32.0	14.46	50.35	32.0	8.24	5.51
	8.33	−8.27		15.91	−15.88		7.03	−6.96		18.19	+18.16		7.65	−7.58
$21^{h}\ 38^{m}\ 10^{s}.025$			$22^{h}\ 15^{m}\ 56^{s}.333$			$22^{h}\ 37^{m}\ 32^{s}.703$			$23^{h}\ 27^{m}\ 44^{s}.392$			$23^{h}\ 47^{m}\ 12^{s}.813$		
−83° 6′ 23″.31			−86° 23′ 45″.22			−81° 49′ 21″.11			+86° 50′ 39″.03			−82° 29′ 8″.43		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			*α* **Ursæ Minoris.** (*Polaris.*) Mag. 2.1			**4 G. Octantis.** Mag. 5.6			**Groombridge 750.** Mag. 6.7			**Groombridge 944.** Mag. 6.4		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Mar.	0 56	+85 48	Mar.	1 28	+88 51	Mar.	1 41	−85 11	Mar.	4 9	+85 20	Mar.	5 34	+85 9
	s	″		s	″		s	″		s	″		s	″
0.1	45.92	46.74	0.1	53.35	48.77	0.1	58.32	43.31	0.2	49.15	28.69	0.3	66.04	52.52
1.1	45.72	46.51	1.1	52.50	48.57	1.1	58.17	42.99	1.2	48.88	28.71	1.3	65.81	52.65
2.1	45.51	46.26	2.1	51.63	48.34	2.1	58.01	42.66	2.2	48.62	28.70	2.3	65.57	52.78
3.1	45.32	45.99	3.1	50.78	48.10	3.1	57.85	42.38	3.2	48.33	28.68	3.3	65.29	52.88
4.1	45.14	45.70	4.1	50.00	47.83	4.1	57.68	42.09	4.2	48.04	28.61	4.3	65.03	52.95
5.1	44.99	45.38	5.1	49.30	47.56	5.1	57.49	41.81	5.2	47.77	28.53	5.3	64.75	52.99
6.1	44.86	45.06	6.1	48.68	47.26	6.1	57.29	41.55	6.2	47.50	28.41	6.3	64.48	53.00
7.1	44.75	44.76	7.1	48.15	46.98	7.1	57.09	41.28	7.2	47.26	28.31	7.3	64.23	53.00
8.1	44.67	44.47	8.1	47.68	46.70	8.1	56.88	41.01	8.2	47.03	28.18	8.3	63.99	52.98
9.1	44.59	44.19	9.1	47.23	46.45	9.1	56.68	40.68	9.2	46.81	28.08	9.3	63.76	52.97
10.1	44.50	43.91	10.1	46.79	46.20	10.1	56.48	40.35	10.2	46.60	27.97	10.3	63.54	52.98
11.1	44.42	43.65	11.1	46.32	45.95	11.1	56.29	39.98	11.2	46.39	27.87	11.3	63.33	52.99
12.1	44.32	43.39	12.1	45.82	45.70	12.1	56.13	39.63	12.2	46.17	27.78	12.3	63.12	53.01
13.1	44.22	43.12	13.1	45.28	45.46	13.1	55.97	39.25	13.2	45.96	27.72	13.3	62.90	53.02
14.1	44.11	42.84	14.1	44.72	45.21	14.1	55.84	38.88	14.2	45.72	27.63	14.3	62.67	53.06
15.1	43.98	42.57	15.1	44.12	44.93	15.1	55.71	38.53	15.2	45.49	27.54	15.3	62.44	53.10
16.1	43.85	42.27	16.1	43.53	44.65	16.1	55.60	38.19	16.2	45.23	27.45	16.3	62.18	53.12
17.1	43.74	41.96	17.1	42.95	44.37	17.1	55.48	37.84	17.2	44.97	27.35	17.2	61.91	53.13
18.1	43.63	41.63	18.1	42.40	44.06	18.1	55.35	37.51	18.2	44.70	27.22	18.2	61.64	53.11
19.0	43.54	41.30	19.1	41.92	43.74	19.1	55.23	37.19	19.2	44.46	27.06	19.2	61.36	53.08
20.0	43.49	40.97	20.1	41.53	43.42	20.1	55.10	36.88	20.2	44.21	26.89	20.2	61.09	53.03
21.0	43.44	40.62	21.1	41.25	43.08	21.1	54.94	36.58	21.2	43.98	26.68	21.2	60.83	52.94
22.0	43.44	40.29	22.1	41.04	42.76	22.1	54.78	36.27	22.2	43.77	26.47	22.2	60.59	52.84
23.0	43.45	39.98	23.1	40.89	42.47	23.1	54.62	35.91	23.2	43.59	26.28	23.2	60.36	52.74
24.0	43.45	39.70	24.1	40.76	42.18	24.1	54.46	35.53	24.2	43.42	26.09	24.2	60.18	52.65
25.0	43.45	39.43	25.1	40.60	41.91	25.1	54.32	35.14	25.2	43.27	25.94	25.2	59.98	52.56
26.0	43.44	39.18	26.1	40.40	41.67	26.1	54.20	34.73	26.2	43.11	25.78	26.2	59.80	52.50
27.0	43.41	38.92	27.0	40.12	41.42	27.1	54.10	34.30	27.2	42.93	25.66	27.2	59.61	52.46
28.0	43.36	38.65	28.0	39.79	41.16	28.1	54.02	33.89	28.2	42.74	25.53	28.2	59.38	52.43
29.0	43.31	38.36	29.0	39.42	40.87	29.1	53.96	33.51	29.2	42.51	25.38	29.2	59.15	52.40
30.0	43.26	38.04	30.0	39.07	40.55	30.1	53.90	33.13	30.2	42.29	25.20	30.2	58.90	52.35
31.0	43.21	37.69	31.0	38.78	40.23	31.0	53.84	32.80	31.2	42.06	24.99	31.2	58.63	52.24
	13.69	+13.66		50.37	+50.36		11.94	−11.89		12.31	+12.27		11.86	+11.82
	$0^h\ 57^m\ 1^s.657$			$1^h\ 29^m\ 44^s.254$			$1^h\ 42^m\ 6^s.102$			$4^h\ 9^m\ 44^s.952$			$5^h\ 34^m\ 54^s.014$	
	+85° 48′ 25″.87			+88° 51′ 25″.03			−85° 11′ 39″.58			+85° 20′ 1″.04			+85° 9′ 28″.07	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Mensæ.			**ζ Mensæ.**			**51 H. Cephei.**			**25 H. Camelop.**			**7 G. Octantis.**		
Mag. 6.2			Mag. 5.6			Mag. 5.3			Mag. 5.1			Mag. 6.4		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Mar.	5 46	−84 50	Mar.	6 47	−80 43	Mar.	7 1	+87 11	Mar.	7 13	+82 34	Mar.	7 16	−86 54
	s	″		s	″		s	″		s	″		s	″
0.3	25.74	0.39	0.3	5.05	47.15	0.4	65.84	18.10	0.4	42.57	52.64	0.4	44.17	12.38
1.3	25.45	0.41	1.3	4.90	47.29	1.3	65.54	18.33	1.4	42.47	52.88	1.4	43.73	12.55
2.3	25.17	0.44	2.3	4.76	47.42	2.3	65.21	18.56	2.4	42.34	53.11	2.4	43.32	12.73
3.3	24.91	0.49	3.3	4.62	47.54	3.3	64.84	18.80	3.4	42.21	53.34	3.4	42.94	12.90
4.3	24.65	0.56	4.3	4.49	47.70	4.3	64.43	18.98	4.3	42.06	53.54	4.4	42.56	13.09
5.3	24.39	0.63	5.3	4.36	47.86	5.3	64.02	19.13	5.3	41.91	53.72	5.3	42.20	13.30
6.3	24.13	0.71	6.3	4.22	48.04	6.3	63.60	19.27	6.3	41.75	53.86	6.3	41.82	13.53
7.3	23.86	0.81	7.3	4.09	48.24	7.3	63.18	19.41	7.3	41.60	54.00	7.3	41.44	13.76
8.3	23.57	0.91	8.3	3.95	48.43	8.3	62.81	19.52	8.3	41.46	54.14	8.3	41.03	13.99
9.3	23.28	0.99	9.3	3.80	48.61	9.3	62.44	19.61	9.3	41.33	54.26	9.3	40.62	14.22
10.3	22.97	1.05	10.3	3.66	48.78	10.3	62.09	19.74	10.3	41.20	54.37	10.3	40.18	14.45
11.3	22.66	1.09	11.3	3.50	48.93	11.3	61.75	19.86	11.3	41.09	54.49	11.3	39.73	14.64
12.3	22.37	1.11	12.3	3.34	49.08	12.3	61.42	19.97	12.3	40.98	54.63	12.3	39.25	14.82
13.3	22.07	1.12	13.3	3.18	49.18	13.3	61.08	20.11	13.3	40.85	54.77	13.3	38.79	14.97
14.3	21.77	1.11	14.3	3.03	49.26	14.3	60.71	20.25	14.3	40.72	54.92	14.3	38.32	15.11
15.3	21.49	1.07	15.3	2.87	49.34	15.3	60.34	20.39	15.3	40.60	55.07	15.3	37.86	15.25
16.3	21.20	1.03	16.3	2.72	49.40	16.3	59.94	20.53	16.3	40.45	55.22	16.3	37.42	15.36
17.3	20.93	0.99	17.3	2.57	49.46	17.3	59.52	20.68	17.3	40.30	55.36	17.3	36.99	15.47
18.3	20.67	0.97	18.3	2.42	49.54	18.3	59.07	20.80	18.3	40.12	55.51	18.3	36.56	15.60
19.2	20.40	0.96	19.3	2.28	49.62	19.3	58.62	20.90	19.3	39.95	55.61	19.3	36.15	15.73
20.2	20.13	0.97	20.3	2.14	49.72	20.3	58.15	20.95	20.3	39.78	55.70	20.3	35.75	15.87
21.2	19.87	1.01	21.3	2.00	49.83	21.3	57.69	21.01	21.3	39.60	55.77	21.3	35.34	16.04
22.2	19.58	1.02	22.3	1.86	49.97	22.3	57.26	21.02	22.3	39.45	55.81	22.3	34.91	16.22
23.2	19.29	1.03	23.3	1.70	50.10	23.3	56.86	21.02	23.3	39.30	55.85	23.3	34.46	16.39
24.2	18.98	1.02	24.3	1.53	50.20	24.3	56.49	21.05	24.3	39.17	55.88	24.3	33.98	16.55
25.2	18.67	1.00	25.3	1.36	50.29	25.3	56.14	21.08	25.3	39.04	55.91	25.3	33.47	16.69
26.2	18.36	0.93	26.3	1.20	50.34	26.3	55.81	21.12	26.3	38.93	55.96	26.3	32.94	16.79
27.2	18.06	0.85	27.3	1.04	50.38	27.3	55.45	21.16	27.3	38.81	56.00	27.3	32.44	16.89
28.2	17.77	0.74	28.3	0.87	50.37	28.3	55.09	21.24	28.3	38.67	56.11	28.3	31.93	16.92
29.2	17.49	0.63	29.3	0.72	50.36	29.3	54.68	21.32	29.3	38.53	56.21	29.3	31.46	16.96
30.2	17.22	0.54	30.3	0.56	50.36	30.3	54.25	21.38	30.3	38.37	56.30	30.3	31.00	17.01
31.2	16.97	0.44	31.3	0.42	50.35	31.3	53.79	21.42	31.3	38.19	56.36	31.3	30.57	17.04
	11.11	−11.06		6.21	−6.13		20.39	+20.37		7.75	+7.68		18.52	−18.49
5^h	46^m	$26^s.439$	6^h	47^m	$3^s.489$	7^h	1^m	$34^s.861$	7^h	13^m	$29^s.477$	7^h	16^m	$40^s.555$
−84°	49′	48″.17	−80°	43′	34″.16	+87°	11′	0″.11	+82°	34′	36″.50	−86°	54′	0″.14

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			**ζ Octantis.** Mag. 5.4			**1 H. Draconis.** Mag. 4.6			**ζ Chamæleontis.** Mag. 5.2			**30 H. Camelop.** Mag. 5.3		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Mar.	8 15	+88 53	Mar.	9 9	−85 19	Mar.	9 25	+81 41	Mar.	9 36	−80 34	Mar.	10 21	+82 59
	s	″		s	″		s	″		s	″		s	″
0.4	80.72	21.87	0.4	13.33	53.00	0.5	27.42	58.19	0.5	28.81	0.54	0.5	13.98	6.59
1.4	80.25	22.15	1.4	13.15	53.32	1.4	27.41	58.51	1.5	28.74	0.90	1.5	14.00	6.90
2.4	79.68	22.45	2.4	12.98	53.64	2.4	27.37	58.83	2.5	28.67	1.22	2.5	14.01	7.25
3.4	79.01	22.74	3.4	12.83	53.95	3.4	27.33	59.16	3.5	28.61	1.56	3.5	14.01	7.59
4.4	78.25	23.02	4.4	12.68	54.24	4.4	27.28	59.49	4.4	28.55	1.89	4.5	13.98	7.92
5.4	77.43	23.27	5.4	12.55	54.55	5.4	27.21	59.78	5.4	28.50	2.23	5.5	13.94	8.27
6.4	76.59	23.50	6.4	12.41	54.90	6.4	27.13	60.06	6.4	28.45	2.59	6.5	13.90	8.59
7.4	75.75	23.73	7.4	12.27	55.24	7.4	27.05	60.34	7.4	28.41	2.96	7.5	13.85	8.88
8.4	74.93	23.92	8.4	12.14	55.61	8.4	26.99	60.57	8.4	28.35	3.33	8.5	13.80	9.16
9.4	74.16	24.11	9.4	11.98	55.99	9.4	26.92	60.80	9.4	28.30	3.71	9.5	13.75	9.44
10.4	73.42	24.29	10.4	11.80	56.37	10.4	26.87	61.04	10.4	28.24	4.10	10.5	13.72	9.71
11.4	72.72	24.47	11.4	11.62	56.71	11.4	26.80	61.29	11.4	28.17	4.48	11.5	13.68	9.98
12.4	72.04	24.67	12.4	11.42	57.06	12.4	26.76	61.54	12.4	28.09	4.82	12.5	13.65	10.26
13.4	71.35	24.88	13.4	11.22	57.39	13.4	26.71	61.81	13.4	28.01	5.18	13.5	13.63	10.54
14.4	70.63	25.11	14.4	11.01	57.67	14.4	26.66	62.08	14.4	27.92	5.53	14.5	13.62	10.82
15.4	69.89	25.34	15.4	10.77	57.97	15.4	26.59	62.36	15.4	27.83	5.85	15.5	13.58	11.13
16.4	69.08	25.56	16.4	10.57	58.25	16.4	26.53	62.64	16.4	27.74	6.14	16.4	13.53	11.45
17.4	68.22	25.78	17.4	10.36	58.51	17.4	26.44	62.93	17.4	27.65	6.42	17.4	13.48	11.77
18.4	67.27	26.01	18.4	10.16	58.77	18.4	26.35	63.21	18.4	27.57	6.70	18.4	13.42	12.09
19.4	66.26	26.20	19.4	9.97	59.04	19.4	26.26	63.48	19.4	27.48	7.00	19.4	13.33	12.41
20.4	65.23	26.38	20.4	9.78	59.32	20.4	26.14	63.72	20.4	27.42	7.32	20.4	13.24	12.71
21.3	64.18	26.53	21.4	9.61	59.63	21.4	26.03	63.94	21.4	27.35	7.64	21.4	13.14	12.98
22.3	63.16	26.67	22.4	9.43	59.94	22.4	25.92	64.14	22.4	27.28	7.97	22.4	13.05	13.25
23.3	62.20	26.78	23.4	9.23	60.27	23.4	25.82	64.32	23.4	27.20	8.34	23.4	12.95	13.48
24.3	61.30	26.88	24.4	9.01	60.60	24.4	25.73	64.50	24.4	27.12	8.69	24.4	12.87	13.69
25.3	60.48	26.99	25.4	8.78	60.92	25.4	25.65	64.67	25.4	27.02	9.03	25.4	12.81	13.92
26.3	59.70	27.12	26.4	8.53	61.23	26.4	25.59	64.86	26.4	26.92	9.37	26.4	12.75	14.14
27.3	58.91	27.26	27.4	8.26	61.49	27.4	25.52	65.06	27.4	26.80	9.67	27.4	12.69	14.37
28.3	58.09	27.40	28.4	7.99	61.72	28.4	25.44	65.28	28.4	26.70	9.95	28.4	12.63	14.64
29.3	57.18	27.57	29.4	7.74	61.95	29.4	25.35	65.50	29.4	26.58	10.20	29.4	12.56	14.92
30.3	56.19	27.71	30.4	7.49	62.15	30.4	25.25	65.74	30.4	26.47	10.44	30.4	12.47	15.20
31.3	55.13	27.86	31.4	7.25	62.36	31.4	25.14	65.99	31.4	26.36	10.68	31.4	12.37	15.49
	51.64	+51.63		12.29	−12.25		6.93	+6.86		6.10	−6.02		8.19	+8.13
8^h 14^m $48^s.311$			9^h 9^m $6^s.085$			9^h 25^m $12^s.930$			9^h 36^m $24^s.003$			10^h 20^m $57^s.259$		
+88° 53′ 11″.43			−85° 19′ 42″.77			+81° 41′ 57″.18			−80° 33′ 50″.61			+82° 59′ 12″.27		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

η Octantis. Mag. 6.3			**Bradley 1672.** Mag. 6.3			**ι Octantis.** Mag. 5.4			**32 H. Camelop.** *seq.* Mag. 5.3			**κ Octantis.** Mag. 5.6		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Mar.	11 0	−84 8	Mar.	12 15	+88 9	Mar.	12 46	−84 40	Mar.	12 48	+83 51	Mar.	13 27	−85 21
	s	″		s	″		s	″		s	″		s	″
0.5	4.11	37.29	0.6	16.24	38.26	0.6	11.22	3.37	0.6	43.66	48.63	0.6	16.63	22.02
1.5	4.09	37.68	1.6	16.63	38.54	1.6	11.32	3.75	1.6	43.80	48.87	1.6	16.81	22.37
2.5	4.07	38.06	2.6	17.00	38.84	2.6	11.41	4.11	2.6	43.94	49.14	2.6	16.96	22.70
3.5	4.05	38.42	3.6	17.31	39.15	3.6	11.51	4.46	3.6	44.07	49.42	3.6	17.10	23.01
4.5	4.03	38.78	4.6	17.57	39.48	4.6	11.61	4.78	4.6	44.18	49.74	4.6	17.28	23.31
5.5	4.04	39.14	5.6	17.77	39.81	5.6	11.75	5.11	5.6	44.27	50.05	5.6	17.46	23.59
6.5	4.05	39.51	6.6	17.92	40.13	6.6	11.87	5.44	6.6	44.34	50.36	6.6	17.66	23.87
7.5	4.06	39.90	7.6	18.04	40.45	7.6	12.00	5.78	7.6	44.40	50.65	7.6	17.86	24.19
8.5	4.07	40.31	8.6	18.13	40.75	8.6	12.14	6.15	8.6	44.46	50.94	8.6	18.08	24.51
9.5	4.08	40.73	9.5	18.25	41.03	9.6	12.29	6.52	9.6	44.54	51.22	9.6	18.28	24.85
10.5	4.07	41.16	10.5	18.37	41.32	10.6	12.42	6.92	10.6	44.62	51.49	10.6	18.48	25.21
11.5	4.04	41.59	11.5	18.50	41.58	11.6	12.53	7.33	11.6	44.69	51.75	11.6	18.67	25.58
12.5	4.01	42.01	12.5	18.68	41.85	12.6	12.62	7.72	12.6	44.78	52.02	12.6	18.83	25.95
13.5	3.96	42.40	13.5	18.85	42.13	13.6	12.71	8.14	13.6	44.86	52.29	13.6	18.98	26.34
14.5	3.90	42.79	14.5	19.04	42.42	14.6	12.77	8.54	14.6	44.95	52.56	14.6	19.13	26.73
15.5	3.84	43.18	15.5	19.23	42.73	15.6	12.83	8.93	15.6	45.05	52.83	15.6	19.25	27.09
16.5	3.77	43.55	16.5	19.40	43.05	16.5	12.89	9.30	16.6	45.13	53.14	16.6	19.35	27.47
17.5	3.71	43.89	17.5	19.54	43.38	17.5	12.93	9.65	17.5	45.19	53.46	17.6	19.46	27.80
18.5	3.65	44.25	18.5	19.64	43.71	18.5	12.98	10.01	18.5	45.25	53.78	18.6	19.57	28.13
19.5	3.60	44.60	19.5	19.68	44.06	19.5	13.04	10.35	19.5	45.30	54.12	19.6	19.70	28.46
20.5	3.55	44.95	20.5	19.67	44.43	20.5	13.12	10.70	20.5	45.32	54.46	20.6	19.84	28.78
21.5	3.52	45.30	21.5	19.61	44.76	21.5	13.21	11.06	21.5	45.33	54.81	21.6	19.99	29.10
22.5	3.49	45.70	22.5	19.52	45.08	22.5	13.31	11.43	22.5	45.34	55.13	22.6	20.14	29.46
23.5	3.46	46.11	23.5	19.42	45.37	23.5	13.41	11.83	23.5	45.34	55.43	23.6	20.31	29.83
24.5	3.41	46.53	24.5	19.34	45.65	24.5	13.49	12.24	24.5	45.35	55.71	24.6	20.47	30.24
25.5	3.35	46.96	25.5	19.29	45.92	25.5	13.56	12.68	25.5	45.36	55.97	25.6	20.62	30.65
26.4	3.26	47.37	26.5	19.30	46.19	26.5	13.62	13.10	26.5	45.40	56.24	26.6	20.73	31.07
27.4	3.16	47.76	27.5	19.33	46.46	27.5	13.64	13.54	27.5	45.45	56.50	27.5	20.82	31.49
28.4	3.05	48.14	28.5	19.37	46.76	28.5	13.65	13.94	28.5	45.49	56.78	28.5	20.88	31.89
29.4	2.93	48.48	29.5	19.39	47.08	29.5	13.65	14.33	29.5	45.53	57.08	29.5	20.94	32.26
30.4	2.82	48.80	30.5	19.38	47.41	30.5	13.65	14.68	30.5	45.55	57.41	30.5	21.00	32.63
31.4	2.72	49.12	31.5	19.32	47.76	31.5	13.65	15.04	31.5	45.56	57.77	31.5	21.06	32.98
9.80 −9.75			31.18 +31.16			10.76 −10.72			9.36 +9.30			12.35 −12.31		
10h 59m 55s.642			12h 14m 28s.053			12h 46m 1s.183			12h 48m 29s.976			13h 27m 5s.514		
−84° 8′ 31″.24			+88° 9′ 56″.03			−84° 40′ 2″.72			+83° 52′ 10″.05			−85° 21′ 23″.59		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			**Groombridge 2283.** Mag. 7.2			**ρ Octantis.** Mag. 5.7			**ε Ursæ Minoris.** Mag. 4.4			**59 G. Apodis.** Mag. 5.9		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Mar.	14 13	−83 17	Mar.	15 4	+87 32	Mar.	15 23	−84 11	Mar.	16 54	+82 10	Mar.	17 15	−80 46
	s	″		s	″		s	″		s	″		s	″
0.7	26.27	0.75	0.7	9.63	56.00	0.7	50.74	11.03	0.8	28.93	10.37	0.8	47.02	53.03
1.6	26.42	1.04	1.7	10.14	56.08	1.7	50.96	11.24	1.8	29.10	10.30	1.8	47.18	53.06
2.6	26.57	1.33	2.7	10.65	56.19	2.7	51.18	11.42	2.8	29.27	10.23	2.8	47.34	53.11
3.6	26.71	1.59	3.7	11.16	56.33	3.7	51.39	11.59	3.8	29.45	10.20	3.8	47.49	53.12
4.6	26.86	1.82	4.7	11.65	56.50	4.7	51.61	11.75	4.8	29.62	10.20	4.8	47.64	53.11
5.6	27.02	2.07	5.7	12.11	56.68	5.7	51.83	11.89	5.8	29.78	10.23	5.8	47.79	53.08
6.6	27.19	2.32	6.7	12.53	56.86	6.7	52.06	12.04	6.8	29.94	10.26	6.8	47.95	53.04
7.6	27.37	2.58	7.7	12.92	57.07	7.7	52.31	12.20	7.7	30.10	10.32	7.8	48.12	53.01
8.6	27.55	2.84	8.7	13.31	57.26	8.7	52.56	12.37	8.7	30.26	10.35	8.8	48.30	52.98
9.6	27.73	3.14	9.7	13.67	57.43	9.7	52.82	12.55	9.7	30.41	10.40	9.8	48.48	52.96
10.6	27.91	3.43	10.7	14.04	57.60	10.7	53.07	12.73	10.7	30.56	10.45	10.8	48.67	52.98
11.6	28.08	3.76	11.7	14.41	57.76	11.7	53.32	12.95	11.7	30.71	10.48	11.8	48.86	53.01
12.6	28.24	4.08	12.7	14.80	57.91	12.7	53.57	13.19	12.7	30.86	10.51	12.7	49.05	53.07
13.6	28.39	4.41	13.7	15.21	58.06	13.7	53.80	13.44	13.7	31.01	10.53	13.7	49.23	53.13
14.6	28.53	4.76	14.7	15.62	58.22	14.7	54.01	13.70	14.7	31.17	10.54	14.7	49.40	53.21
15.6	28.65	5.09	15.6	16.04	58.40	15.7	54.21	13.95	15.7	31.34	10.58	15.7	49.56	53.30
16.6	28.77	5.42	16.6	16.48	58.58	16.7	54.41	14.20	16.7	31.50	10.61	16.7	49.72	53.38
17.6	28.88	5.72	17.6	16.92	58.78	17.7	54.60	14.44	17.7	31.67	10.67	17.7	49.87	53.47
18.6	29.00	6.02	18.6	17.33	59.01	18.7	54.78	14.67	18.7	31.84	10.75	18.7	50.02	53.52
19.6	29.12	6.31	19.6	17.72	59.27	19.7	54.97	14.87	19.7	32.00	10.86	19.7	50.17	53.58
20.6	29.25	6.59	20.6	18.07	59.53	20.6	55.17	15.07	20.7	32.16	10.98	20.7	50.31	53.62
21.6	29.39	6.88	21.6	18.38	59.80	21.6	55.39	15.28	21.7	32.31	11.12	21.7	50.48	53.64
22.6	29.54	7.18	22.6	18.68	60.06	22.6	55.61	15.49	22.7	32.45	11.27	22.7	50.65	53.68
23.6	29.70	7.51	23.6	18.93	60.30	23.6	55.85	15.72	23.7	32.59	11.41	23.7	50.83	53.71
24.6	29.84	7.86	24.6	19.18	60.54	24.6	56.09	15.98	24.7	32.72	11.55	24.7	51.02	53.79
25.6	30.00	8.22	25.6	19.44	60.75	25.6	56.33	16.26	25.7	32.85	11.66	25.7	51.22	53.88
26.6	30.14	8.61	26.6	19.73	60.95	26.6	56.54	16.58	26.7	32.99	11.76	26.7	51.40	54.02
27.6	30.25	9.00	27.6	20.04	61.15	27.6	56.75	16.89	27.7	33.13	11.85	27.7	51.59	54.16
28.6	30.34	9.38	28.6	20.36	61.37	28.6	56.93	17.21	28.7	33.27	11.95	28.7	51.75	54.31
29.6	30.42	9.73	29.6	20.70	61.60	29.6	57.10	17.50	29.7	33.42	12.05	29.7	51.90	54.46
30.6	30.50	10.07	30.6	21.05	61.86	30.6	57.25	17.79	30.7	33.57	12.17	30.7	52.04	54.58
31.6	30.58	10.39	31.6	21.37	62.15	31.6	57.41	18.05	31.7	33.72	12.33	31.7	52.18	54.70
	8.55	−8.49		23.39	+23.37		9.87	−9.82		7.34	+7.27		6.24	−6.16
	14^h 13^m	$18^s.531$		15^h 4^m	$0^s.607$		15^h 23^m	$43^s.237$		16^h 54^m	$31^s.741$		17^h 15^m	$43^s.730$
	−83° 17′	4″.27		+87° 33′	24″.43		−84° 11′	17″.84		+82° 10′	38″.40		−80° 47′	2″.69

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Ursæ Minoris. Mag. 4.4			**χ Octantis.** Mag. 5.2			**λ Ursæ Minoris.** Mag. 6.6			**σ Octantis.** Mag. 5.5			**76 Draconis.** Mag. 5.7		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Mar.	17 59	+86 36	Mar.	18 5	−87 39	Mar.	19 2	+89 0	Mar.	19 25	−89 13	Mar.	20 48	+82 13
	s	″		s	″		s	″		s	″		s	″
0.8	4.30	27.09	0.8	40.97	40.72	0.9	28.58	38.16	0.9	58.35	24.24	0.9	32.48	8.58
1.8	4.63	26.95	1.8	41.61	40.67	1.9	29.49	37.93	1.9	60.04	24.05	1.9	32.54	8.26
2.8	4.99	26.77	2.8	42.21	40.60	2.8	30.51	37.72	2.9	61.61	23.86	2.9	32.62	7.94
3.8	5.36	26.64	3.8	42.78	40.52	3.8	31.62	37.52	3.9	63.11	23.66	3.9	32.70	7.62
4.8	5.75	26.54	4.8	43.34	40.43	4.8	32.79	37.33	4.9	64.53	23.45	4.9	32.79	7.32
5.8	6.13	26.48	5.8	43.90	40.32	5.8	33.98	37.18	5.9	65.95	23.23	5.9	32.89	7.05
6.8	6.51	26.42	6.8	44.50	40.20	6.8	35.17	37.04	6.9	67.41	23.01	6.9	33.00	6.80
7.8	6.88	26.38	7.8	45.12	40.08	7.8	36.32	36.90	7.9	68.94	22.76	7.9	33.11	6.58
8.8	7.21	26.36	8.8	45.77	39.96	8.8	37.42	36.78	8.8	70.57	22.52	8.9	33.22	6.35
9.8	7.56	26.33	9.8	46.45	39.85	9.8	38.47	36.67	9.8	72.29	22.29	9.9	33.32	6.13
10.8	7.88	26.30	10.8	47.14	39.77	10.8	39.49	36.55	10.8	74.09	22.06	10.9	33.42	5.91
11.8	8.20	26.26	11.8	47.84	39.72	11.8	40.48	36.43	11.8	75.94	21.85	11.9	33.52	5.69
12.8	8.54	26.21	12.8	48.54	39.69	12.8	41.48	36.31	12.8	77.82	21.66	12.9	33.62	5.46
13.8	8.87	26.15	13.8	49.22	39.66	13.8	42.50	36.18	13.8	79.70	21.50	13.9	33.72	5.22
14.8	9.21	26.09	14.8	49.88	39.65	14.8	43.56	36.04	14.8	81.55	21.35	14.9	33.81	4.97
15.8	9.58	26.02	15.8	50.53	39.65	15.8	44.66	35.90	15.8	83.36	21.20	15.9	33.91	4.71
16.8	9.96	25.95	16.8	51.15	39.65	16.8	45.83	35.75	16.8	85.12	21.07	16.9	34.02	4.45
17.8	10.34	25.90	17.8	51.75	39.65	17.8	47.07	35.62	17.8	86.79	20.95	17.9	34.14	4.19
18.8	10.75	25.90	18.8	52.33	39.63	18.8	48.35	35.51	18.8	88.40	20.82	18.9	34.26	3.95
19.8	11.14	25.90	19.8	52.91	39.59	19.8	49.67	35.43	19.8	89.98	20.67	19.9	34.39	3.73
20.8	11.52	25.95	20.8	53.50	39.55	20.8	50.99	35.38	20.8	91.58	20.49	20.9	34.53	3.53
21.8	11.90	26.02	21.8	54.12	39.49	21.8	52.28	35.32	21.8	93.23	20.31	21.9	34.68	3.36
22.7	12.25	26.08	22.8	54.77	39.43	22.8	53.50	35.31	22.8	94.98	20.12	22.9	34.81	3.21
23.7	12.59	26.15	23.8	55.47	39.39	23.8	54.64	35.29	23.8	96.84	19.95	23.9	34.95	3.07
24.7	12.90	26.21	24.7	56.20	39.37	24.8	55.70	35.27	24.8	98.84	19.78	24.9	35.08	2.94
25.7	13.21	26.26	25.7	56.94	39.37	25.8	56.72	35.24	25.8	100.91	19.64	25.9	35.20	2.80
26.7	13.52	26.26	26.7	57.67	39.42	26.8	57.73	35.19	26.8	103.02	19.52	26.9	35.32	2.63
27.7	13.84	26.28	27.7	58.38	39.48	27.8	58.77	35.13	27.8	105.09	19.42	27.9	35.43	2.46
28.7	14.18	26.29	28.7	59.04	39.55	28.8	59.87	35.07	28.8	107.07	19.35	28.9	35.55	2.28
29.7	14.54	26.31	29.7	59.66	39.61	29.8	61.08	35.00	29.8	108.93	19.29	29.8	35.68	2.08
30.7	14.92	26.35	30.7	60.25	39.65	30.8	62.38	34.94	30.8	110.70	19.22	30.8	35.82	1.88
31.7	15.31	26.43	31.7	60.82	39.70	31.8	63.73	34.92	31.8	112.39	19.14	31.8	35.96	1.70
16.90 +16.87			24.50 −24.48			57.88 +57.87			73.70 −73.69			7.39 +7.32		
17^h 59^m $20^s.805$			18^h 5^m $36^s.163$			19^h 3^m $51^s.560$			19^h 26^m $7^s.189$			20^h 48^m $44^s.660$		
+86° 36′ 51″.19			−87° 39′ 52″.21			+89° 0′ 56″.70			−89° 13′ 35″.99			+82° 13′ 16″.38		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			**υ Octantis.** Mag. 5.7			**β Octantis.** Mag. 4.3			**39 H. Cephei.** Mag. 5.6			**γ^1 Octantis.** Mag. 5.1		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Mar.	21 38	−83 6	Mar.	22 15	−86 23	Mar.	22 37	−81 49	Mar.	23 27	+86 50	Mar.	23 47	−82 28
	s	″		s	″		s	″		s	″		s	″
0.9	6.84	15.42	0.9	47.61	38.32	1.0	29.29	15.73	1.0	14.71	51.03	1.0	8.25	66.26
1.9	6.95	15.09	1.9	47.75	37.99	1.9	29.34	15.38	2.0	14.57	50.71	2.0	8.25	65.88
2.9	7.04	14.77	2.9	47.87	37.65	2.9	29.38	15.04	3.0	14.46	50.35	3.0	8.24	65.51
3.9	7.13	14.45	3.9	47.97	37.29	3.9	29.40	14.69	4.0	14.38	50.00	4.0	8.21	65.18
4.9	7.20	14.14	4.9	48.05	36.91	4.9	29.42	14.34	5.0	14.33	49.66	5.0	8.16	64.84
5.9	7.27	13.82	5.9	48.10	36.55	5.9	29.44	13.97	6.0	14.32	49.32	6.0	8.13	64.47
6.9	7.34	13.45	6.9	48.17	36.18	6.9	29.45	13.61	7.0	14.33	48.99	7.0	8.08	64.11
7.9	7.42	13.06	7.9	48.25	35.79	7.9	29.47	13.22	8.0	14.35	48.67	8.0	8.04	63.74
8.9	7.50	12.69	8.9	48.34	35.40	8.9	29.50	12.80	9.0	14.38	48.38	9.0	8.00	63.34
9.9	7.61	12.31	9.9	48.45	34.99	9.9	29.53	12.40	10.0	14.40	48.10	10.0	7.98	62.93
10.9	7.72	11.91	10.9	48.59	34.58	10.9	29.58	11.98	11.0	14.41	47.82	11.0	7.97	62.51
11.9	7.85	11.54	11.9	48.75	34.17	11.9	29.64	11.58	12.0	14.41	47.52	12.0	7.97	62.09
12.9	7.98	11.20	12.9	48.93	33.78	12.9	29.71	11.19	13.0	14.41	47.24	13.0	7.97	61.66
13.9	8.11	10.85	13.9	49.12	33.39	13.9	29.78	10.80	13.9	14.39	46.95	14.0	7.98	61.25
14.9	8.25	10.53	14.9	49.32	33.04	14.9	29.87	10.42	14.9	14.37	46.63	15.0	8.01	60.87
15.9	8.39	10.22	15.9	49.51	32.70	15.9	29.94	10.07	15.9	14.35	46.31	16.0	8.03	60.48
16.9	8.52	9.93	16.9	49.71	32.36	16.9	30.00	9.74	16.9	14.34	45.98	17.0	8.05	60.12
17.9	8.64	9.63	17.9	49.89	32.03	17.9	30.07	9.39	17.9	14.36	45.64	18.0	8.06	59.75
18.9	8.75	9.35	18.9	50.04	31.71	18.9	30.12	9.06	18.9	14.41	45.28	18.9	8.07	59.40
19.9	8.86	9.04	19.9	50.18	31.38	19.9	30.17	8.73	19.9	14.49	44.95	19.9	8.07	59.04
20.9	8.96	8.71	20.9	50.32	31.04	20.9	30.22	8.38	20.9	14.61	44.61	20.9	8.06	58.68
21.9	9.06	8.38	21.9	50.45	30.69	21.9	30.26	8.01	21.9	14.74	44.29	21.9	8.06	58.31
22.9	9.18	8.04	22.9	50.61	30.30	22.9	30.31	7.62	22.9	14.88	44.00	22.9	8.06	57.91
23.9	9.31	7.68	23.9	50.78	29.91	23.9	30.38	7.20	23.9	15.02	43.73	23.9	8.06	57.49
24.9	9.46	7.30	24.9	50.99	29.51	24.9	30.46	6.80	24.9	15.15	43.46	24.9	8.08	57.05
25.9	9.62	6.95	25.9	51.23	29.12	25.9	30.56	6.39	25.9	15.26	43.21	25.9	8.12	56.61
26.9	9.80	6.62	26.9	51.50	28.75	26.9	30.66	6.00	26.9	15.34	42.94	26.9	8.17	56.18
27.9	9.99	6.33	27.9	51.78	28.41	27.9	30.77	5.63	27.9	15.40	42.68	27.9	8.23	55.77
28.9	10.17	6.05	28.9	52.05	28.09	28.9	30.89	5.29	28.9	15.46	42.39	28.9	8.29	55.38
29.9	10.32	5.80	29.9	52.31	27.80	29.9	31.00	4.97	29.9	15.54	42.07	29.9	8.35	55.00
30.9	10.47	5.56	30.9	52.54	27.51	30.9	31.11	4.66	30.9	15.64	41.75	30.9	8.40	54.64
31.9	10.61	5.30	31.9	52.75	27.21	31.9	31.18	4.36	31.9	15.79	41.43	31.9	8.44	54.31
8.33	−8.27		15.89	−15.86		7.03	−6.96		18.18	+18.15		7.64	−7.58	
21^{h}	38^{m}	$10^{s}.025$	22^{h}	15^{m}	$56^{s}.333$	22^{h}	37^{m}	$32^{s}.703$	23^{h}	27^{m}	$44^{s}.392$	23^{h}	47^{m}	$12^{s}.813$
−83°	6′	23″.31	−86°	23′	45″.22	−81°	49′	21″.11	+86°	50′	39″.03	−82°	29′	8″.43

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			*α* **Ursæ Minoris.** (*Polaris.*) Mag. 2.1			**4 G. Octantis.** Mag. 5.6			**Groombridge 750.** Mag. 6.7			**Groombridge 944.** Mag. 6.4		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Apr.	0 56	+85 48	Apr.	1 28	+88 51	Apr.	1 41	−85 11	Apr.	4 9	+85 20	Apr.	5 34	+85 9
	s	″		s	″		s	″		s	″		s	″
0.0	43.21	37.69	0.0	38.78	40.23	0.0	53.84	32.80	0.2	42.06	24.99	0.2	58.63	52.24
1.0	43.20	37.35	1.0	38.57	39.89	1.0	53.75	32.47	1.1	41.84	24.77	1.2	58.37	52.14
2.0	43.22	37.00	2.0	38.46	39.52	2.0	53.66	32.13	2.1	41.64	24.54	2.2	58.11	52.00
3.0	43.26	36.65	3.0	38.44	39.17	3.0	53.55	31.80	3.1	41.45	24.25	3.2	57.87	51.85
4.0	43.31	36.31	4.0	38.47	38.83	4.0	53.44	31.45	4.1	41.29	23.99	4.2	57.64	51.68
5.0	43.38	36.00	5.0	38.56	38.52	5.0	53.34	31.09	5.1	41.14	23.74	5.2	57.44	51.50
5.9	43.45	35.71	6.0	38.66	38.23	6.0	53.24	30.71	6.1	41.00	23.50	6.2	57.25	51.35
6.9	43.52	35.43	7.0	38.75	37.93	7.0	53.15	30.31	7.1	40.87	23.27	7.2	57.07	51.20
7.9	43.58	35.15	8.0	38.80	37.64	8.0	53.07	29.89	8.1	40.74	23.05	8.2	56.89	51.05
8.9	43.63	34.87	9.0	38.83	37.36	9.0	53.02	29.48	9.1	40.61	22.83	9.2	56.74	50.92
9.9	43.68	34.60	10.0	38.83	37.07	10.0	52.98	29.07	10.1	40.45	22.62	10.2	56.52	50.79
10.9	43.71	34.30	11.0	38.80	36.79	11.0	52.96	28.69	11.1	40.31	22.42	11.2	56.32	50.67
11.9	43.75	34.00	12.0	38.76	36.48	12.0	52.95	28.29	12.1	40.14	22.23	12.2	56.11	50.55
12.9	43.78	33.71	13.0	38.73	36.16	13.0	52.93	27.91	13.1	39.97	21.99	13.2	55.89	50.42
13.9	43.82	33.39	13.9	38.73	35.86	14.0	52.92	27.54	14.1	39.81	21.74	14.2	55.66	50.28
14.9	43.87	33.07	14.9	38.79	35.53	15.0	52.89	27.21	15.1	39.64	21.48	15.2	55.43	50.10
15.9	43.96	32.72	15.9	38.92	35.18	16.0	52.86	26.86	16.1	39.49	21.18	16.2	55.21	49.89
16.9	44.06	32.38	16.9	39.15	34.85	17.0	52.83	26.52	17.1	39.35	20.89	17.2	55.01	49.68
17.9	44.20	32.09	17.9	39.47	34.50	17.9	52.77	26.18	18.1	39.25	20.56	18.2	54.82	49.44
18.9	44.34	31.80	18.9	39.87	34.18	18.9	52.72	25.81	19.1	39.16	20.25	19.2	54.65	49.19
19.9	44.51	31.52	19.9	40.29	33.90	19.9	52.67	25.43	20.1	39.10	19.96	20.2	54.50	48.95
20.9	44.67	31.27	20.9	40.72	33.62	20.9	52.63	25.02	21.1	39.04	19.68	21.2	54.38	48.72
21.9	44.82	31.03	21.9	41.09	33.35	21.9	52.61	24.58	22.1	38.98	19.44	22.1	54.26	48.52
22.9	44.93	30.80	22.9	41.41	33.11	22.9	52.60	24.17	23.1	38.93	19.21	23.1	54.14	48.34
23.9	45.04	30.59	23.9	41.66	32.88	23.9	52.63	23.74	24.1	38.84	18.98	24.1	54.01	48.16
24.9	45.15	30.35	24.9	41.86	32.60	24.9	52.68	23.32	25.1	38.76	18.73	25.1	53.86	48.00
25.9	45.24	30.08	25.9	42.05	32.32	25.9	52.72	22.95	26.1	38.65	18.48	26.1	53.67	47.82
26.9	45.34	29.79	26.9	42.28	32.00	26.9	52.77	22.58	27.1	38.53	18.22	27.1	53.49	47.60
27.9	45.47	29.49	27.9	42.59	31.70	27.9	52.81	22.24	28.1	38.42	17.91	28.1	53.30	47.38
28.9	45.61	29.19	28.9	42.99	31.38	28.9	52.83	21.91	29.1	38.32	17.61	29.1	53.12	47.13
29.9	45.79	28.91	29.9	43.48	31.07	29.9	52.83	21.56	30.1	38.24	17.26	30.1	52.97	46.84
30.9	45.97	28.63	30.9	44.03	30.76	30.9	52.84	21.22	31.1	38.19	16.93	31.1	52.81	46.54
	13.68	+13.65		50.25	+50.24		11.93	−11.89		12.31	+12.27		11.86	+11.82
$0^h\ 57^m\ 1^s.657$			$1^h\ 29^m\ 44^s.254$			$1^h\ 42^m\ 6^s.102$			$4^h\ 9^m\ 44^s.952$			$5^h\ 34^m\ 54^s.014$		
+85° 48′ 25″.87			+88° 51′ 25″.03			−85° 11′ 39″.58			+85° 20′ 1″.04			+85° 9′ 28″.07		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Mensæ. Mag. 6.2			ζ Mensæ. Mag. 5.6			51 H. Cephei. Mag. 5.3			25 H. Camelop. Mag. 5.1			7 G. Octantis. Mag. 6.4		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Apr.	5 46	−84 49	Apr.	6 46	−80 43	Apr.	7 1	+87 11	Apr.	7 13	+82 34	Apr.	7 16	−86 54
	s	″		s	″		s	″		s	″		s	″
0.2	16.97	60.44	0.3	60.42	50.35	0.3	53.79	21.42	0.3	38.19	56.36	0.3	30.57	17.04
1.2	16.72	60.38	1.3	60.27	50.38	1.3	53.30	21.44	1.3	38.01	56.39	1.3	30.15	17.11
2.2	16.47	60.32	2.3	60.13	50.41	2.3	52.82	21.41	2.3	37.82	56.39	2.3	29.73	17.21
3.2	16.20	60.27	3.2	59.98	50.47	3.3	52.35	21.39	3.3	37.65	56.39	3.3	29.32	17.30
4.2	15.93	60.23	4.2	59.84	50.53	4.3	51.92	21.33	4.3	37.48	56.34	4.3	28.85	17.42
5.2	15.65	60.18	5.2	59.69	50.58	5.3	51.49	21.28	5.3	37.33	56.32	5.3	28.40	17.51
6.2	15.36	60.10	6.2	59.54	50.60	6.3	51.11	21.20	6.3	37.19	56.28	6.3	27.94	17.60
7.2	15.08	60.01	7.2	59.37	50.61	7.3	50.72	21.16	7.3	37.05	56.23	7.3	27.45	17.67
8.2	14.80	59.90	8.2	59.22	50.60	8.2	50.35	21.13	8.3	36.91	56.22	8.3	26.95	17.72
9.2	14.52	59.77	9.2	59.05	50.58	9.2	49.98	21.10	9.3	36.78	56.21	9.3	26.45	17.73
10.2	14.24	59.64	10.2	58.88	50.55	10.2	49.60	21.07	10.2	36.64	56.20	10.3	25.94	17.75
11.2	13.97	59.47	11.2	58.73	50.48	11.2	49.22	21.05	11.2	36.50	56.20	11.2	25.47	17.74
12.2	13.72	59.30	12.2	58.58	50.40	12.2	48.82	21.04	12.2	36.36	56.20	12.2	25.00	17.73
13.2	13.47	59.12	13.2	58.43	50.32	13.2	48.40	21.01	13.2	36.19	56.19	13.2	24.53	17.70
14.2	13.23	58.97	14.2	58.29	50.24	14.2	47.96	20.97	14.2	36.01	56.19	14.2	24.10	17.68
15.2	13.01	58.82	15.2	58.15	50.17	15.2	47.49	20.91	15.2	35.84	56.14	15.2	23.67	17.68
16.2	12.77	58.71	16.2	58.01	50.14	16.2	47.03	20.83	16.2	35.68	56.08	16.2	23.24	17.68
17.2	12.53	58.60	17.2	57.88	50.10	17.2	46.59	20.72	17.2	35.50	55.99	17.2	22.83	17.70
18.2	12.29	58.48	18.2	57.74	50.07	18.2	46.16	20.58	18.2	35.34	55.86	18.2	22.40	17.73
19.2	12.03	58.36	19.2	57.59	50.06	19.2	45.77	20.44	19.2	35.19	55.73	19.2	21.96	17.77
20.2	11.76	58.23	20.2	57.44	50.03	20.2	45.41	20.29	20.2	35.06	55.60	20.2	21.49	17.79
21.2	11.49	58.10	21.2	57.29	49.99	21.2	45.09	20.14	21.2	34.96	55.49	21.2	20.99	17.80
22.2	11.22	57.92	22.2	57.13	49.92	22.2	44.77	20.00	22.2	34.84	55.38	22.2	20.49	17.79
23.2	10.96	57.72	23.2	56.97	49.83	23.2	44.48	19.90	23.2	34.73	55.29	23.2	19.98	17.75
24.2	10.71	57.49	24.2	56.82	49.69	24.2	44.17	19.80	24.2	34.62	55.22	24.2	19.48	17.66
25.1	10.47	57.25	25.2	56.67	49.55	25.2	43.82	19.72	25.2	34.48	55.16	25.2	19.00	17.58
26.1	10.25	57.02	26.2	56.53	49.38	26.2	43.45	19.65	26.2	34.34	55.09	26.2	18.56	17.47
27.1	10.05	56.79	27.2	56.40	49.23	27.2	43.03	19.54	27.2	34.18	55.00	27.2	18.13	17.39
28.1	9.85	56.60	28.2	56.26	49.11	28.2	42.62	19.40	28.2	34.03	54.90	28.2	17.74	17.31
29.1	9.65	56.41	29.2	56.14	48.99	29.2	42.19	19.22	29.2	33.87	54.75	29.2	17.35	17.27
30.1	9.45	56.24	30.2	56.02	48.91	30.2	41.78	19.03	30.2	33.71	54.61	30.2	16.95	17.22
31.1	9.23	56.06	31.2	55.89	48.82	31.2	41.40	18.84	31.2	33.56	54.42	31.2	16.54	17.19
	11.10	−11.06		6.21	−6.13		20.39	+20.37		7.75	+7.68		18.52	−18.49
5^h 46^m $26^s.439$			6^h 47^m $3^s.489$			7^h 1^m $34^s.861$			7^h 13^m $29^s.477$			7^h 16^m $40^s.555$		
−84° 49′ 48″.17			−80° 43′ 34″.16			+87° 11′ 0″.11			+82° 34′ 36″.50			−86° 54′ 0″.14		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			**ζ Octantis.** Mag. 5.4			**1 H. Draconis.** Mag. 4.6			**ζ Chamæleontis.** Mag. 5.2			**30 H. Camelop.** Mag. 5.3		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Apr.	8 15	+88 53	Apr.	9 8	−85 20	Apr.	9 25	+81 42	Apr.	9 36	−80 34	Apr.	10 21	+82 59
	s	″		s	″		s	″		s	″		s	″
0.3	55.13	27.86	0.4	67.25	2.36	0.4	25.14	5.99	0.4	26.36	10.68	0.4	12.37	15.49
1.3	53.98	28.00	1.4	67.03	2.58	1.4	25.00	6.21	1.4	26.27	10.92	1.4	12.25	15.78
2.3	52.82	28.09	2.4	66.82	2.82	2.4	24.86	6.41	2.4	26.18	11.18	2.4	12.12	16.05
3.3	51.65	28.15	3.4	66.62	3.07	3.4	24.73	6.59	3.4	26.08	11.45	3.4	11.98	16.29
4.3	50.52	28.21	4.3	66.39	3.33	4.4	24.59	6.74	4.4	25.99	11.73	4.4	11.84	16.51
5.3	49.44	28.27	5.3	66.16	3.58	5.4	24.44	6.88	5.4	25.90	12.02	5.4	11.72	16.71
6.3	48.41	28.30	6.3	65.92	3.85	6.4	24.35	7.01	6.4	25.80	12.31	6.4	11.61	16.91
7.3	47.42	28.35	7.3	65.67	4.11	7.4	24.25	7.14	7.4	25.69	12.59	7.4	11.49	17.09
8.3	46.47	28.39	8.3	65.40	4.34	8.3	24.14	7.27	8.4	25.58	12.86	8.4	11.38	17.28
9.3	45.53	28.46	9.3	65.13	4.56	9.3	24.04	7.41	9.4	25.45	13.11	9.4	11.28	17.47
10.3	44.59	28.52	10.3	64.85	4.76	10.3	23.94	7.55	10.4	25.33	13.34	10.4	11.18	17.68
11.3	43.63	28.59	11.3	64.56	4.96	11.3	23.83	7.71	11.3	25.20	13.57	11.4	11.08	17.90
12.3	42.63	28.65	12.3	64.29	5.11	12.3	23.72	7.88	12.3	25.08	13.76	12.4	10.97	18.12
13.3	41.58	28.73	13.3	64.00	5.27	13.3	23.59	8.05	13.3	24.96	13.96	13.4	10.85	18.33
14.3	40.47	28.81	14.3	63.74	5.43	14.3	23.46	8.20	14.3	24.83	14.16	14.4	10.72	18.56
15.3	39.30	28.85	15.3	63.50	5.56	15.3	23.32	8.36	15.3	24.72	14.34	15.4	10.57	18.78
16.3	38.10	28.87	16.3	63.25	5.73	16.3	23.16	8.48	16.3	24.61	14.52	16.4	10.42	18.98
17.3	36.88	28.88	17.3	63.02	5.91	17.3	23.02	8.58	17.3	24.50	14.72	17.4	10.25	19.17
18.3	35.70	28.84	18.3	62.78	6.09	18.3	22.87	8.66	18.3	24.40	14.95	18.4	10.10	19.32
19.3	34.57	28.80	19.3	62.54	6.30	19.3	22.72	8.72	19.3	24.29	15.18	19.4	9.94	19.46
20.3	33.53	28.74	20.3	62.28	6.51	20.3	22.59	8.77	20.3	24.18	15.41	20.4	9.79	19.57
21.3	32.58	28.69	21.3	62.00	6.71	21.3	22.48	8.81	21.3	24.06	15.64	21.4	9.65	19.66
22.3	31.68	28.62	22.3	61.71	6.90	22.3	22.36	8.85	22.3	23.93	15.87	22.3	9.52	19.76
23.3	30.80	28.60	23.3	61.40	7.05	23.3	22.26	8.91	23.3	23.80	16.06	23.3	9.41	19.88
24.3	29.92	28.58	24.3	61.09	7.18	24.3	22.16	8.99	24.3	23.65	16.21	24.3	9.30	20.01
25.3	28.98	28.58	25.3	60.78	7.27	25.3	22.05	9.08	25.3	23.52	16.35	25.3	9.18	20.16
26.2	27.97	28.58	26.3	60.49	7.36	26.3	21.91	9.16	26.3	23.37	16.48	26.3	9.05	20.32
27.2	26.87	28.57	27.3	60.21	7.44	27.3	21.78	9.26	27.3	23.24	16.58	27.3	8.90	20.49
28.2	25.71	28.54	28.3	59.94	7.52	28.3	21.63	9.34	28.3	23.11	16.68	28.3	8.73	20.65
29.2	24.52	28.50	29.3	59.70	7.61	29.3	21.47	9.40	29.3	23.01	16.81	29.3	8.56	20.79
30.2	23.33	28.40	30.3	59.45	7.72	30.3	21.31	9.44	30.3	22.89	16.93	30.3	8.37	20.91
31.2	22.18	28.30	31.3	59.21	7.84	31.3	21.16	9.45	31.3	22.78	17.09	31.3	8.18	21.01
	51.68	+51.67		12.30	−12.25		6.93	+6.86		6.10	−6.02		8.19	+8.13
8^{h}	14^{m}	$48^{s}.311$	9^{h}	9^{m}	$6^{s}.085$	9^{h}	25^{m}	$12^{s}.930$	9^{h}	36^{m}	$24^{s}.003$	10^{h}	20^{m}	$57^{s}.259$
+88°	53′	11″.43	−85°	19′	42″.77	+81°	41′	57″.18	−80°	33′	50″.61	+82°	59′	12″.27

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

η Octantis. Mag. 6.3			Bradley 1672. Mag. 6.3			ι Octantis. Mag. 5.4			32 H. Camelop. *seq.* Mag. 5.3			κ Octantis. Mag. 5.6		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Apr.	10 59	−84 8	Apr.	12 15	+88 9	Apr.	12 46	−84 40	Apr.	12 48	+83 51	Apr.	13 27	−85 21
	s	″		s	″		s	″		s	″		s	″
0.4	62.72	49.12	0.5	19.32	47.76	0.5	13.65	15.04	0.5	45.56	57.77	0.5	21.06	32.98
1.4	62.63	49.43	1.5	19.19	48.12	1.5	13.67	15.38	1.5	45.56	58.13	1.5	21.13	33.31
2.4	62.55	49.75	2.5	19.00	48.47	2.5	13.70	15.72	2.5	45.53	58.47	2.5	21.22	33.64
3.4	62.49	50.09	3.5	18.77	48.79	3.5	13.74	16.09	3.5	45.49	58.81	3.5	21.32	33.98
4.4	62.41	50.45	4.5	18.52	49.11	4.5	13.79	16.45	4.5	45.45	59.15	4.5	21.42	34.35
5.4	62.34	50.82	5.5	18.28	49.39	5.5	13.84	16.84	5.5	45.41	59.46	5.5	21.53	34.70
6.4	62.25	51.19	6.5	18.03	49.67	6.5	13.87	17.24	6.5	45.37	59.76	6.5	21.63	35.08
7.4	62.16	51.55	7.5	17.83	49.94	7.5	13.89	17.66	7.5	45.34	60.04	7.5	21.72	35.49
8.4	62.05	51.92	8.5	17.64	50.21	8.5	13.90	18.06	8.5	45.31	60.33	8.5	21.78	35.90
9.4	61.92	52.27	9.5	17.45	50.47	9.5	13.90	18.47	9.5	45.30	60.61	9.5	21.83	36.30
10.4	61.78	52.61	10.5	17.30	50.74	10.5	13.87	18.85	10.5	45.29	60.88	10.5	21.86	36.71
11.4	61.64	52.93	11.5	17.14	51.02	11.5	13.84	19.24	11.5	45.28	61.17	11.5	21.88	37.10
12.4	61.49	53.23	12.5	16.97	51.32	12.5	13.80	19.62	12.5	45.24	61.47	12.5	21.88	37.49
13.4	61.35	53.52	13.5	16.79	51.61	13.5	13.75	19.98	13.5	45.22	61.80	13.5	21.89	37.86
14.4	61.21	53.80	14.5	16.56	51.92	14.5	13.71	20.32	14.5	45.19	62.13	14.5	21.88	38.20
15.4	61.08	54.07	15.4	16.27	52.24	15.5	13.66	20.66	15.5	45.14	62.47	15.5	21.89	38.53
16.4	60.97	54.35	16.4	15.95	52.56	16.5	13.65	20.99	16.5	45.06	62.80	16.5	21.92	38.87
17.4	60.86	54.65	17.4	15.57	52.85	17.5	13.63	21.32	17.5	44.98	63.13	17.5	21.96	39.20
18.4	60.76	54.96	18.4	15.15	53.14	18.5	13.63	21.67	18.5	44.89	63.43	18.5	22.01	39.54
19.4	60.65	55.27	19.4	14.72	53.38	19.5	13.63	22.03	19.5	44.79	63.72	19.5	22.06	39.90
20.4	60.52	55.59	20.4	14.30	53.64	20.5	13.64	22.42	20.5	44.70	63.99	20.5	22.11	40.30
21.4	60.39	55.93	21.4	13.91	53.86	21.5	13.62	22.83	21.5	44.61	64.23	21.5	22.16	40.71
22.4	60.25	56.26	22.4	13.58	54.06	22.4	13.58	23.24	22.5	44.55	64.46	22.5	22.17	41.12
23.4	60.09	56.59	23.4	13.28	54.27	23.4	13.52	23.65	23.4	44.49	64.70	23.5	22.17	41.53
24.4	59.91	56.88	24.4	13.00	54.50	24.4	13.44	24.03	24.4	44.43	64.95	24.5	22.13	41.94
25.4	59.73	57.14	25.4	12.72	54.75	25.4	13.36	24.41	25.4	44.38	65.22	25.5	22.08	42.32
26.4	59.55	57.38	26.4	12.39	55.02	26.4	13.26	24.73	26.4	44.30	65.48	26.5	22.03	42.69
27.4	59.38	57.60	27.4	12.04	55.29	27.4	13.17	25.05	27.4	44.22	65.79	27.5	21.97	43.02
28.4	59.22	57.82	28.4	11.63	55.57	28.4	13.08	25.36	28.4	44.13	66.10	28.5	21.93	43.34
29.4	59.08	58.05	29.4	11.17	55.84	29.4	13.03	25.66	29.4	44.01	66.40	29.5	21.89	43.64
30.4	58.95	58.30	30.4	10.65	56.10	30.4	12.96	25.97	30.4	43.88	66.70	30.5	21.88	43.97
31.4	58.81	58.54	31.4	10.09	56.34	31.4	12.92	26.28	31.4	43.76	66.99	31.5	21.88	44.28
	9.81	−9.76		31.22	+31.20		10.77	−10.72		9.36	+9.31		12.36	−12.32
$10^h\ 59^m\ 55^s.642$			$12^h\ 14^m\ 28^s.053$			$12^h\ 46^m\ 1^s.183$			$12^h\ 48^m\ 29^s.976$			$13^h\ 27^m\ 5^s.514$		
−84° 8′ 31″.24			+88° 9′ 56″.03			−84° 40′ 2″.72			+83° 52′ 10″.05			−85° 21′ 23″.59		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Octantis. Mag. 4.1		**Groombridge 2283.** Mag. 7.2			**ρ Octantis.** Mag. 5.7			**ε Ursæ Minoris.** Mag. 4.4			**59 G. Apodis.** Mag. 5.9		
Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
14 13	−83 17	Apr.	15 4	+87 33	Apr.	15 23	−84 11	Apr.	16 54	+82 10	Apr.	17 15	−80 46
s	″		s	″		s	″		s	″		s	″
30.58	10.39	0.6	21.37	2.15	0.6	57.41	18.05	0.7	33.72	12.33	0.7	52.18	54.70
30.67	10.71	1.6	21.66	2.44	1.6	57.56	18.30	1.7	33.88	12.51	1.7	52.32	54.81
30.76	11.02	2.6	21.91	2.76	2.6	57.73	18.55	2.7	34.03	12.73	2.7	52.46	54.90
30.87	11.33	3.6	22.13	3.07	3.6	57.91	18.80	3.7	34.16	12.95	3.7	52.61	54.98
30.99	11.65	4.6	22.32	3.37	4.6	58.10	19.05	4.7	34.28	13.17	4.7	52.77	55.05
31.11	11.99	5.6	22.48	3.67	5.6	58.30	19.31	5.7	34.40	13.38	5.7	52.94	55.15
31.22	12.36	6.6	22.64	3.96	6.6	58.50	19.59	6.7	34.52	13.59	6.7	53.12	55.27
31.33	12.72	7.6	22.83	4.23	7.6	58.69	19.90	7.7	34.63	13.79	7.7	53.28	55.42
31.42	13.10	8.6	23.00	4.49	8.6	58.87	20.22	8.7	34.75	13.99	8.7	53.45	55.58
31.50	13.49	9.6	23.18	4.75	9.6	59.04	20.55	9.7	34.87	14.17	9.7	53.61	55.75
31.57	13.86	10.6	23.39	5.01	10.6	59.19	20.88	10.7	34.99	14.34	10.7	53.77	55.94
31.63	14.25	11.6	23.60	5.28	11.6	59.34	21.21	11.7	35.12	14.52	11.7	53.92	56.14
31.68	14.62	12.6	23.82	5.55	12.6	59.47	21.54	12.6	35.25	14.71	12.7	54.06	56.35
31.73	14.97	13.6	24.03	5.84	13.6	59.58	21.86	13.6	35.38	14.91	13.7	54.20	56.53
31.77	15.31	14.6	24.24	6.15	14.6	59.70	22.16	14.6	35.50	15.13	14.7	54.32	56.71
31.82	15.63	15.6	24.41	6.48	15.6	59.83	22.45	15.6	35.62	15.38	15.7	54.44	56.87
31.88	15.96	16.6	24.55	6.82	16.6	59.95	22.73	16.6	35.74	15.64	16.7	54.56	57.03
31.94	16.27	17.6	24.65	7.17	17.6	60.09	23.00	17.6	35.85	15.92	17.6	54.70	57.15
32.02	16.59	18.6	24.72	7.51	18.6	60.24	23.26	18.6	35.94	16.21	18.6	54.84	57.29
32.10	16.95	19.6	24.74	7.85	19.6	60.40	23.57	19.6	36.03	16.50	19.6	54.99	57.43
32.18	17.31	20.6	24.76	8.16	20.6	60.56	23.88	20.6	36.12	16.79	20.6	55.16	57.60
32.25	17.70	21.5	24.79	8.44	21.6	60.72	24.20	21.6	36.20	17.05	21.6	55.32	57.79
32.32	18.10	22.5	24.82	8.71	22.6	60.88	24.55	22.6	36.28	17.30	22.6	55.48	58.01
32.36	18.52	23.5	24.87	8.97	23.6	61.02	24.92	23.6	36.36	17.52	23.6	55.64	58.26
32.39	18.91	24.5	24.96	9.24	24.6	61.13	25.31	24.6	36.45	17.74	24.6	55.78	58.51
32.41	19.28	25.5	25.05	9.51	25.6	61.22	25.66	25.6	36.55	17.95	25.6	55.91	58.77
32.42	19.65	26.5	25.16	9.82	26.5	61.30	25.99	26.6	36.65	18.22	26.6	56.02	59.01
32.43	19.98	27.5	25.24	10.13	27.5	61.37	26.33	27.6	36.75	18.48	27.6	56.12	59.22
32.43	20.31	28.5	25.30	10.48	28.5	61.44	26.63	28.6	36.84	18.78	28.6	56.23	59.42
32.45	20.63	29.5	25.31	10.82	29.5	61.53	26.92	29.6	36.93	19.09	29.6	56.34	59.61
32.48	20.94	30.5	25.30	11.17	30.5	61.62	27.20	30.6	37.00	19.42	30.6	56.45	59.78
32.51	21.25	31.5	25.26	11.53	31.5	61.73	27.50	31.6	37.07	19.74	31.6	56.58	59.98
6	−8.50		23.41	+23.39		9.88	−9.83		7.34	+7.27		6.24	−6.16
13^{m} 18^{s}.531			15^{h} 4^{m} 0^{s}.607			15^{h} 23^{m} 43^{s}.237			16^{h} 54^{m} 31^{s}.741			17^{h} 15^{m} 43^{s}.730	
17′ 4″.27			+87° 33′ 24″.43			−84° 11′ 17″.84			+82° 10′ 38″.40			−80° 47′ 2″.69	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Ursæ Minoris. Mag. 4.4			χ Octantis. Mag. 5.2			λ Ursæ Minoris. Mag. 6.6			σ Octantis. Mag. 5.5			76 Draconis. Mag. 5.7		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Apr.	17 59	+86 36	Apr.	18 6	−87 39	Apr.	19 3	+89 0	Apr.	19 26	−89 13	Apr.	20 48	+82 13
	s	″		s	″		s	″		s	″		s	″
0.7	15.31	26.43	0.7	0.82	39.70	0.8	3.73	34.92	0.8	52.39	19.14	0.8	35.96	1.70
1.7	15.69	26.51	1.7	1.38	39.75	1.8	5.09	34.92	1.8	54.03	19.05	1.8	36.12	1.56
2.7	16.08	26.64	2.7	1.97	39.77	2.8	6.44	34.95	2.8	55.69	18.95	2.8	36.29	1.43
3.7	16.43	26.78	3.7	2.56	39.77	3.8	7.76	34.99	3.8	57.40	18.83	3.8	36.45	1.33
4.7	16.77	26.90	4.7	3.20	39.78	4.8	9.02	35.03	4.8	59.19	18.72	4.8	36.61	1.24
5.7	17.10	27.05	5.7	3.85	39.81	5.8	10.21	35.08	5.8	61.08	18.61	5.8	36.77	1.16
6.7	17.42	27.21	6.7	4.53	39.85	6.8	11.34	35.13	6.8	63.03	18.51	6.8	36.92	1.09
7.7	17.72	27.32	7.7	5.21	39.92	7.8	12.46	35.18	7.8	65.02	18.42	7.8	37.06	1.01
8.7	18.01	27.45	8.7	5.88	40.00	8.7	13.54	35.21	8.8	67.05	18.36	8.8	37.20	0.92
9.7	18.31	27.56	9.7	6.54	40.08	9.7	14.62	35.25	9.8	69.08	18.31	9.8	37.34	0.83
10.7	18.62	27.65	10.7	7.19	40.20	10.7	15.73	35.27	10.8	71.08	18.29	10.8	37.49	0.73
11.7	18.94	27.75	11.7	7.81	40.33	11.7	16.88	35.30	11.8	73.02	18.28	11.8	37.62	0.63
12.7	19.27	27.86	12.7	8.40	40.46	12.7	18.06	35.34	12.8	74.92	18.28	12.8	37.77	0.53
13.7	19.62	27.98	13.7	8.97	40.60	13.7	19.30	35.38	13.8	76.72	18.28	13.8	37.92	0.42
14.7	19.96	28.13	14.7	9.52	40.71	14.7	20.58	35.44	14.7	78.45	18.27	14.8	38.08	0.32
15.7	20.31	28.29	15.7	10.04	40.81	15.7	21.89	35.52	15.7	80.12	18.26	15.8	38.26	0.24
16.7	20.64	28.49	16.7	10.58	40.89	16.7	23.20	35.61	16.7	81.78	18.23	16.8	38.42	0.18
17.7	20.97	28.71	17.7	11.13	40.97	17.7	24.47	35.73	17.7	83.47	18.18	17.8	38.60	0.15
18.7	21.26	28.93	18.7	11.72	41.05	18.7	25.67	35.86	18.7	85.23	18.13	18.8	38.78	0.15
19.7	21.54	29.16	19.7	12.33	41.12	19.7	26.78	36.00	19.7	87.10	18.09	19.8	38.95	0.17
20.7	21.79	29.38	20.7	12.98	41.21	20.7	27.80	36.14	20.7	89.08	18.03	20.8	39.11	0.21
21.7	22.03	29.58	21.7	13.65	41.33	21.7	28.76	36.28	21.7	91.14	18.01	21.8	39.26	0.24
22.7	22.26	29.77	22.7	14.32	41.48	22.7	29.68	36.41	22.7	93.25	18.00	22.8	39.40	0.25
23.7	22.50	29.95	23.7	14.97	41.65	23.7	30.60	36.52	23.7	95.33	18.03	23.8	39.54	0.25
24.7	22.75	30.10	24.7	15.57	41.84	24.7	31.57	36.62	24.7	97.34	18.09	24.8	39.68	0.24
25.7	23.02	30.25	25.7	16.13	42.04	25.7	32.63	36.71	25.7	99.24	18.16	25.8	39.83	0.21
26.7	23.30	30.45	26.7	16.64	42.23	26.7	33.74	36.82	26.7	101.00	18.24	26.8	39.99	0.18
27.6	23.60	30.65	27.7	17.11	42.40	27.7	34.93	36.94	27.7	102.66	18.30	27.8	40.16	0.16
28.6	23.90	30.89	28.7	17.59	42.55	28.7	36.14	37.08	28.7	104.25	18.35	28.8	40.33	0.17
29.6	24.19	31.12	29.6	18.07	42.70	29.7	37.33	37.26	29.7	105.82	18.37	29.8	40.50	0.20
30.6	24.46	31.40	30.6	18.56	42.82	30.7	38.49	37.46	30.7	107.44	18.39	30.8	40.68	0.25
31.6	24.70	31.68	31.6	19.07	42.95	31.7	39.58	37.68	31.7	109.10	18.41	31.8	40.86	0.33
	16.91	+16.88		24.50	−24.48		57.87	+57.86		73.62	−73.61		7.38	+7.32
17^{h}	59^{m}	$20^{s}.805$	18^{h}	5^{m}	$36^{s}.163$	19^{h}	3^{m}	$51^{s}.560$	19^{h}	26^{m}	$7^{s}.189$	20^{h}	48^{m}	$44^{s}.660$
+86°	36′	51″.19	−87°	39′	52″.21	+89°	0′	56″.70	−89°	13′	35″.99	+82°	13′	16″.38

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			**υ Octantis.** Mag. 5.7			**β Octantis.** Mag. 4.3			**39 H. Cephei.** Mag. 5.6			**γ¹ Octantis.** Mag. 5.1		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Apr.	21 38	−83 5	Apr.	22 15	−86 23	Apr.	22 37	−81 48	Apr.	23 27	+86 50	Apr.	23 47	−82 28
	s	″		s	″		s	″		s	″		s	″
0.9	10.61	65.30	0.9	52.75	27.21	0.9	31.18	64.36	0.9	15.79	41.43	0.9	8.44	54.31
1.9	10.75	65.03	1.9	52.95	26.90	1.9	31.24	64.05	1.9	15.97	41.12	1.9	8.46	53.97
2.9	10.87	64.75	2.9	53.14	26.59	2.9	31.31	63.72	2.9	16.17	40.80	2.9	8.48	53.63
3.9	11.00	64.47	3.9	53.33	26.28	3.9	31.39	63.39	3.9	16.40	40.52	3.9	8.51	53.26
4.9	11.14	64.18	4.9	53.54	25.94	4.9	31.47	63.04	4.9	16.63	40.25	4.9	8.54	52.88
5.9	11.29	63.86	5.9	53.77	25.60	5.9	31.56	62.68	5.9	16.86	40.00	5.9	8.59	52.48
6.9	11.46	63.56	6.9	54.01	25.26	6.9	31.65	62.31	6.9	17.08	39.75	6.9	8.63	52.07
7.9	11.64	63.28	7.9	54.29	24.92	7.9	31.77	61.96	7.9	17.28	39.52	7.9	8.69	51.66
8.9	11.81	63.00	8.9	54.58	24.60	8.9	31.89	61.60	8.9	17.47	39.27	8.9	8.77	51.25
9.9	12.00	62.74	9.9	54.88	24.29	9.9	32.02	61.26	9.9	17.65	39.03	9.9	8.85	50.86
10.9	12.19	62.49	10.9	55.20	24.00	10.9	32.15	60.94	10.9	17.82	38.78	10.9	8.94	50.48
11.9	12.38	62.29	11.9	55.51	23.73	11.9	32.27	60.64	11.9	17.99	38.52	11.9	9.03	50.12
12.8	12.57	62.08	12.9	55.81	23.47	12.9	32.41	60.35	12.9	18.17	38.24	12.9	9.11	49.78
13.8	12.75	61.88	13.9	56.10	23.22	13.9	32.52	60.07	13.9	18.36	37.97	13.9	9.19	49.43
14.8	12.91	61.67	14.9	56.38	22.98	14.9	32.63	59.82	14.9	18.59	37.69	14.9	9.26	49.09
15.8	13.06	61.47	15.9	56.64	22.74	15.9	32.73	59.56	15.9	18.84	37.42	15.9	9.33	48.77
16.8	13.22	61.28	16.9	56.88	22.49	16.9	32.83	59.28	16.9	19.12	37.17	16.9	9.39	48.46
17.8	13.36	61.04	17.9	57.12	22.23	17.9	32.93	58.99	17.9	19.44	36.93	17.9	9.45	48.12
18.8	13.52	60.79	18.9	57.37	21.94	18.9	33.03	58.69	18.9	19.76	36.72	18.9	9.51	47.76
19.8	13.70	60.58	19.9	57.64	21.63	19.9	33.14	58.35	19.9	20.08	36.52	19.9	9.58	47.37
20.8	13.88	60.26	20.9	57.94	21.32	20.9	33.27	58.02	20.9	20.38	36.35	20.9	9.66	46.99
21.8	14.08	60.01	21.8	58.27	21.03	21.9	33.40	57.69	21.9	20.67	36.18	21.9	9.76	46.61
22.8	14.31	59.78	22.8	58.62	20.74	22.9	33.55	57.36	22.9	20.92	36.02	22.9	9.87	46.22
23.8	14.53	59.57	23.8	59.00	20.49	23.9	33.71	57.06	23.9	21.17	35.84	23.9	10.00	45.84
24.8	14.74	59.38	24.8	59.37	20.23	24.9	33.88	56.79	24.9	21.41	35.66	24.9	10.12	45.49
25.8	14.95	59.23	25.8	59.72	20.03	25.9	34.03	56.57	25.9	21.64	35.45	25.9	10.23	45.16
26.8	15.15	59.10	26.8	60.06	19.84	26.9	34.17	56.35	26.9	21.90	35.24	26.9	10.35	44.87
27.8	15.33	58.96	27.8	60.37	19.67	27.8	34.31	56.14	27.9	22.19	35.02	27.9	10.46	44.59
28.8	15.49	58.82	28.8	60.66	19.49	28.8	34.43	55.91	28.9	22.51	34.81	28.9	10.55	44.31
29.8	15.65	58.66	29.8	60.94	19.28	29.8	34.53	55.70	29.9	22.87	34.60	29.9	10.64	44.02
30.8	15.82	58.48	30.8	61.21	19.07	30.8	34.65	55.45	30.9	23.24	34.40	30.9	10.73	43.72
31.8	16.00	58.31	31.8	61.50	18.84	31.8	34.77	55.18	31.9	23.61	34.23	31.9	10.81	43.41
8.32 −8.26			15.88 −15.85			7.02 −6.95			18.16 +18.13			7.64 −7.58		
$21^h\ 38^m\ 10^s.025$			$22^h\ 15^m\ 56^s.333$			$22^h\ 37^m\ 32^s.703$			$23^h\ 27^m\ 44^s.392$			$23^h\ 47^m\ 12^s.813$		
−83° 6′ 23″.31			−86° 23′ 45″.22			−81° 49′ 21″.11			+86° 50′ 39″.03			−82° 29′ 8″.43		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			**α Ursæ Minoris.** (*Polaris.*) Mag. 2.1			**4 G. Octantis.** Mag. 5.6			**Groombridge 750.** Mag. 6.7			**Groombridge 944.** Mag. 6.4		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
May	0 56	+85 48	May	1 28	+88 51	May	1 41	−85 11	May	4 9	+85 20	May	5 34	+85 9
	s	″		s	″		s	″		s	″		s	″
0.9	45.97	28.63	0.9	44.03	30.76	0.9	52.84	21.22	1.1	38.19	16.93	1.1	52.81	46.54
1.9	46.20	28.37	1.9	44.65	30.47	1.9	52.84	20.88	2.1	38.15	16.59	2.1	52.69	46.25
2.9	46.41	28.13	2.9	45.30	30.20	2.9	52.84	20.52	3.1	38.14	16.27	3.1	52.58	45.97
3.9	46.63	27.90	3.9	45.92	29.93	3.9	52.86	20.14	4.1	38.13	15.95	4.1	52.49	45.69
4.9	46.82	27.70	4.9	46.52	29.69	4.9	52.89	19.78	5.1	38.13	15.67	5.1	52.39	45.43
5.9	47.02	27.50	5.9	47.10	29.46	5.9	52.94	19.37	6.1	38.13	15.41	6.1	52.30	45.18
6.9	47.20	27.30	6.9	47.63	29.23	6.9	53.00	18.98	7.0	38.11	15.14	7.1	52.21	44.95
7.9	47.38	27.10	7.9	48.14	29.00	7.9	53.09	18.58	8.0	38.08	14.86	8.1	52.11	44.69
8.9	47.55	26.87	8.9	48.62	28.75	8.9	53.18	18.20	9.0	38.05	14.60	9.1	52.01	44.46
9.9	47.72	26.65	9.9	49.10	28.50	9.9	53.28	17.82	10.0	38.01	14.31	10.1	51.90	44.23
10.9	47.89	26.41	10.9	49.60	28.24	10.9	53.38	17.49	11.0	37.98	14.05	11.1	51.77	44.03
11.9	48.07	26.19	11.9	50.13	27.97	11.9	53.47	17.15	12.0	37.93	13.74	12.1	51.64	43.76
12.9	48.27	25.95	12.9	50.75	27.69	12.9	53.55	16.84	13.0	37.90	13.41	13.1	51.51	43.47
13.9	48.50	25.72	13.9	51.43	27.40	13.9	53.63	16.53	14.0	37.89	13.09	14.1	51.41	43.15
14.9	48.74	25.49	14.9	52.21	27.15	14.9	53.71	16.22	15.0	37.89	12.74	15.1	51.32	42.85
15.9	49.01	25.28	15.9	53.07	26.90	15.9	53.78	15.90	16.0	37.94	12.39	16.1	51.27	42.51
16.9	49.30	25.10	16.9	53.96	26.67	16.9	53.83	15.57	17.0	37.99	12.06	17.1	51.22	42.17
17.9	49.57	24.96	17.9	54.87	26.48	17.9	53.88	15.21	18.0	38.08	11.75	18.1	51.20	41.85
18.9	49.84	24.83	18.9	55.75	26.31	18.9	53.95	14.83	19.0	38.16	11.47	19.1	51.20	41.56
19.9	50.10	24.70	19.9	56.57	26.16	19.9	54.03	14.44	20.0	38.25	11.21	20.1	51.18	41.31
20.9	50.33	24.58	20.9	57.32	25.99	20.9	54.16	14.06	21.0	38.30	10.97	21.1	51.17	41.06
21.9	50.55	24.45	21.9	57.99	25.82	21.9	54.30	13.68	22.0	38.36	10.72	22.1	51.14	40.80
22.9	50.76	24.29	22.9	58.64	25.64	22.9	54.45	13.36	23.0	38.40	10.45	23.1	51.09	40.55
23.9	50.97	24.13	23.9	59.29	25.45	23.9	54.61	13.03	24.0	38.40	10.18	24.1	51.03	40.28
24.9	51.18	23.95	24.9	60.01	25.22	24.9	54.75	12.73	24.9	38.44	9.87	25.1	50.96	40.00
25.9	51.42	23.78	25.9	60.81	24.99	25.9	54.88	12.45	25.9	38.46	9.56	26.1	50.90	39.68
26.9	51.70	23.60	26.9	61.68	24.75	26.9	55.01	12.20	26.9	38.51	9.23	27.1	50.84	39.36
27.9	51.98	23.44	27.9	62.63	24.54	27.9	55.11	11.92	27.9	38.59	8.89	28.1	50.80	39.02
28.9	52.30	23.29	28.9	63.65	24.36	28.9	55.22	11.65	28.9	38.68	8.56	29.0	50.80	38.66
29.9	52.62	23.16	29.9	64.70	24.19	29.9	55.32	11.36	29.9	38.78	8.22	30.0	50.80	38.31
30.8	52.93	23.06	30.9	65.74	24.04	30.9	55.45	11.07	30.9	38.90	7.92	31.0	50.83	37.97
31.8	53.22	22.98	31.9	66.75	23.90	31.9	55.57	10.75	31.9	39.04	7.63	32.0	50.86	37.68
13.68	+13.64		50.15	+50.14		11.92	−11.88		12.30	+12.26		11.86	+11.81	
0^h	57^m	$1^s.657$	1^h	29^m	$44^s.254$	1^h	42^m	$6^s.102$	4^h	9^m	$44^s.952$	5^h	34^m	$54^s.014$
+85°	48′	25″.87	+88°	51′	25″.03	−85°	11′	39″.58	+85°	20′	1″.04	+85°	9′	28″.07

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Mensæ. Mag. 6.2			**ζ Mensæ.** Mag. 5.6			**51 H. Cephei.** Mag. 5.3			**25 H. Camelop.** Mag. 5.1			**7 G. Octantis.** Mag. 6.4		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
May	5 46	−84 49	May	6 46	−80 43	May	7 1	+87 11	May	7 13	+82 34	May	7 16	−86 54
	s	″		s	″		s	″		s	″		s	″
1.1	9.23	56.06	1.2	55.89	48.82	1.2	41.40	18.84	1.2	33.56	54.42	1.2	16.54	17.19
2.1	9.01	55.91	2.2	55.76	48.73	2.2	41.05	18.62	2.2	33.42	54.24	2.2	16.13	17.16
3.1	8.79	55.72	3.2	55.62	48.63	3.2	40.72	18.41	3.2	33.29	54.05	3.2	15.70	17.13
4.1	8.57	55.53	4.2	55.49	48.52	4.2	40.42	18.22	4.2	33.19	53.85	4.2	15.25	17.05
5.1	8.35	55.31	5.2	55.35	48.38	5.2	40.13	18.03	5.2	33.08	53.68	5.2	14.79	16.97
6.1	8.12	55.09	6.2	55.21	48.22	6.2	39.86	17.83	6.2	32.98	53.52	6.2	14.34	16.89
7.1	7.91	54.82	7.2	55.07	48.04	7.2	39.58	17.68	7.2	32.88	53.37	7.2	13.88	16.76
8.1	7.71	54.56	8.2	54.95	47.86	8.2	39.29	17.50	8.2	32.78	53.21	8.2	13.46	16.62
9.1	7.52	54.28	9.2	54.81	47.65	9.2	39.01	17.34	9.2	32.66	53.07	9.2	13.02	16.48
10.1	7.34	53.99	10.1	54.69	47.45	10.2	38.69	17.17	10.2	32.54	52.92	10.2	12.61	16.32
11.1	7.17	53.72	11.1	54.57	47.25	11.2	38.37	16.99	11.2	32.41	52.78	11.2	12.23	16.16
12.1	7.00	53.46	12.1	54.46	47.05	12.2	38.03	16.81	12.2	32.28	52.61	12.2	11.85	16.00
13.1	6.85	53.22	13.1	54.35	46.88	13.2	37.68	16.61	13.2	32.15	52.41	13.2	11.50	15.86
14.1	6.68	53.00	14.1	54.25	46.73	14.1	37.34	16.35	14.2	32.02	52.21	14.2	11.16	15.76
15.1	6.51	52.79	15.1	54.14	46.57	15.1	37.03	16.08	15.2	31.89	51.97	15.2	10.80	15.65
16.1	6.34	52.57	16.1	54.03	46.42	16.1	36.74	15.81	16.2	31.79	51.72	16.2	10.43	15.56
17.1	6.16	52.35	17.1	53.92	46.27	17.1	36.51	15.51	17.1	31.69	51.46	17.2	10.03	15.46
18.1	5.98	52.11	18.1	53.79	46.11	18.1	36.30	15.23	18.1	31.63	51.20	18.1	9.62	15.35
19.1	5.79	51.85	19.1	53.67	45.92	19.1	36.12	14.98	19.1	31.56	50.94	19.1	9.20	15.22
20.1	5.60	51.57	20.1	53.55	45.70	20.1	35.97	14.73	20.1	31.51	50.72	20.1	8.78	15.05
21.1	5.41	51.25	21.1	53.42	45.48	21.1	35.80	14.51	21.1	31.45	50.52	21.1	8.35	14.86
22.1	5.26	50.92	22.1	53.32	45.20	22.1	35.61	14.30	22.1	31.37	50.33	22.1	7.96	14.66
23.1	5.12	50.59	23.1	53.21	44.94	23.1	35.40	14.07	23.1	31.29	50.13	23.1	7.58	14.43
24.1	4.99	50.28	24.1	53.11	44.67	24.1	35.16	13.87	24.1	31.20	49.94	24.1	7.24	14.20
25.1	4.89	49.98	25.1	53.02	44.42	25.1	34.89	13.64	25.1	31.09	49.72	25.1	6.92	14.00
26.1	4.77	49.69	26.1	52.93	44.19	26.1	34.62	13.37	26.1	30.99	49.47	26.1	6.62	13.81
27.1	4.66	49.45	27.1	52.85	43.97	27.1	34.37	13.10	27.1	30.88	49.21	27.1	6.33	13.62
28.1	4.54	49.19	28.1	52.76	43.77	28.1	34.13	12.79	28.1	30.79	48.92	28.1	6.05	13.47
29.1	4.41	48.94	29.1	52.68	43.57	29.1	33.93	12.47	29.1	30.71	48.62	29.1	5.73	13.31
30.1	4.28	48.70	30.1	52.59	43.37	30.1	33.74	12.13	30.1	30.66	48.32	30.1	5.41	13.15
31.0	4.15	48.43	31.1	52.50	43.14	31.1	33.60	11.85	31.1	30.59	48.03	31.1	5.08	12.97
32.0	4.02	48.14	32.1	52.40	42.92	32.1	33.49	11.53	32.1	30.54	47.75	32.1	4.74	12.79
11.10 −11.05			6.21 −6.13			20.38 +20.36			7.74 +7.68			18.52 −18.49		
5^h 46^m $26^s.439$			6^h 47^m $3^s.489$			7^h 1^m $34^s.861$			7^h 13^m $29^s.477$			7^h 16^m $40^s.555$		
−84° 49′ 48″.17			−80° 43′ 34″.16			+87° 11′ 0″.11			+82° 34′ 36″.50			−86° 54′ 0″.14		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			**ζ Octantis.** Mag. 5.4			**1 H. Draconis.** Mag. 4.6			**ζ Chamæleontis.** Mag. 5.2			**30 H. Camelop.** Mag. 5.3		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
May	8 14	+88 53	May	9 8	−85 20	May	9 25	+81 42	May	9 36	−80 34	May	10 21	+82 59
	s	″		s	″		s	″		s	″		s	″
1.2	82.18	28.30	1.3	59.21	7.84	1.3	21.16	9.45	1.3	22.78	17.09	1.3	8.18	21.01
2.2	81.07	28.17	2.3	58.95	7.97	2.3	21.00	9.46	2.3	22.68	17.24	2.3	8.01	21.09
3.2	80.03	28.04	3.3	58.69	8.10	3.3	20.86	9.45	3.3	22.55	17.40	3.3	7.85	21.15
4.2	79.07	27.93	4.3	58.41	8.22	4.3	20.73	9.41	4.3	22.42	17.54	4.3	7.70	21.21
5.2	78.14	27.81	5.3	58.13	8.33	5.3	20.61	9.39	5.3	22.29	17.70	5.3	7.54	21.26
6.2	77.25	27.70	6.3	57.83	8.43	6.3	20.49	9.38	6.3	22.16	17.81	6.3	7.41	21.31
7.2	76.37	27.61	7.3	57.52	8.48	7.3	20.38	9.39	7.3	22.02	17.92	7.3	7.27	21.37
8.2	75.49	27.50	8.3	57.21	8.53	8.3	20.26	9.38	8.3	21.87	17.99	8.3	7.13	21.43
9.2	74.58	27.42	9.3	56.92	8.57	9.3	20.14	9.37	9.3	21.73	18.05	9.3	6.99	21.49
10.2	73.65	27.34	10.2	56.62	8.56	10.3	20.01	9.40	10.3	21.59	18.11	10.3	6.84	21.58
11.2	72.65	27.24	11.2	56.34	8.57	11.3	19.87	9.42	11.3	21.45	18.15	11.3	6.68	21.67
12.2	71.62	27.14	12.2	56.07	8.57	12.3	19.73	9.43	12.3	21.33	18.19	12.3	6.51	21.74
13.2	70.54	27.01	13.2	55.80	8.58	13.3	19.58	9.41	13.3	21.20	18.23	13.3	6.33	21.81
14.2	69.47	26.87	14.2	55.56	8.62	14.2	19.43	9.37	14.3	21.09	18.28	14.3	6.15	21.86
15.2	68.41	26.69	15.2	55.32	8.65	15.2	19.27	9.30	15.3	20.98	18.35	15.3	5.96	21.87
16.2	67.41	26.50	16.2	55.07	8.71	16.2	19.12	9.22	16.3	20.86	18.44	16.3	5.78	21.87
17.2	66.50	26.27	17.2	54.80	8.77	17.2	18.98	9.11	17.2	20.75	18.53	17.3	5.61	21.84
18.2	65.68	26.06	18.2	54.54	8.83	18.2	18.87	8.99	18.2	20.62	18.62	18.3	5.46	21.78
19.2	64.95	25.86	19.2	54.25	8.88	19.2	18.76	8.88	19.2	20.49	18.69	19.3	5.31	21.72
20.2	64.28	25.67	20.2	53.93	8.91	20.2	18.66	8.77	20.2	20.35	18.76	20.3	5.17	21.68
21.2	63.60	25.48	21.2	53.63	8.91	21.2	18.56	8.67	21.2	20.20	18.80	21.3	5.04	21.64
22.2	62.91	25.31	22.2	53.32	8.87	22.2	18.46	8.61	22.2	20.05	18.82	22.3	4.91	21.63
23.2	62.14	25.16	23.2	53.03	8.82	23.2	18.35	8.55	23.2	19.91	18.78	23.3	4.77	21.63
24.2	61.31	25.00	24.2	52.74	8.76	24.2	18.22	8.50	24.2	19.77	18.74	24.3	4.62	21.65
25.2	60.40	24.84	25.2	52.48	8.68	25.2	18.09	8.44	25.2	19.64	18.71	25.3	4.46	21.65
26.2	59.46	24.65	26.2	52.24	8.63	26.2	17.95	8.35	26.2	19.53	18.67	26.3	4.28	21.64
27.2	58.51	24.42	27.2	52.01	8.59	27.2	17.80	8.22	27.2	19.42	18.65	27.3	4.09	21.61
28.2	57.60	24.20	28.2	51.77	8.56	28.2	17.66	8.09	28.2	19.30	18.64	28.2	3.90	21.57
29.2	56.74	23.95	29.2	51.54	8.55	29.2	17.52	7.96	29.2	19.20	18.66	29.2	3.72	21.49
30.2	55.96	23.68	30.2	51.31	8.53	30.2	17.39	7.78	30.2	19.08	18.67	30.2	3.55	21.40
31.2	55.25	23.42	31.2	51.05	8.50	31.2	17.28	7.62	31.2	18.96	18.67	31.2	3.40	21.30
32.2	54.61	23.14	32.2	50.78	8.47	32.2	17.17	7.45	32.2	18.83	18.66	32.2	3.25	21.18
	51.66	+51.65		12.30	−12.26		6.93	+6.86		6.10	−6.02		8.19	+8.13
8^h 14^m $48^s.311$			9^h 9^m $6^s.085$			9^h 25^m $12^s.930$			9^h 36^m $24^s.003$			10^h 20^m $57^s.259$		
+88° 53′ 11″.43			−85° 19′ 42″.77			+81° 41′ 57″.18			−80° 33′ 50″.61			+82° 59′ 12″.27		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

η Octantis. Mag. 6.3			**Bradley 1672.** Mag. 6.3			**ι Octantis.** Mag. 5.4			**32 H. Camelop.** *seq.* Mag. 5.3			**κ Octantis.** Mag. 5.6		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
May	10 59	−84 8	May	12 14	+88 9	May	12 46	−84 40	May	12 48	+83 52	May	13 27	−85 21
	s	″		s	″		s	″		s	″		s	″
1.4	58.81	58.54	1.4	70.09	56.34	1.4	12.92	26.28	1.4	43.76	6.99	1.5	21.88	44.28
2.3	58.69	58.81	2.4	69.56	56.55	2.4	12.87	26.60	2.4	43.62	7.23	2.5	21.87	44.64
3.3	58.53	59.07	3.4	69.03	56.73	3.4	12.82	26.95	3.4	43.49	7.48	3.4	21.87	45.00
4.3	58.38	59.34	4.4	68.51	56.92	4.4	12.76	27.30	4.4	43.35	7.71	4.4	21.86	45.36
5.3	58.21	59.59	5.4	68.03	57.10	5.4	12.68	27.65	5.4	43.24	7.93	5.4	21.82	45.74
6.3	58.03	59.83	6.4	67.57	57.28	6.4	12.59	28.00	6.4	43.13	8.13	6.4	21.76	46.10
7.3	57.85	60.06	7.4	67.13	57.44	7.4	12.49	28.34	7.4	43.02	8.34	7.4	21.70	46.47
8.3	57.65	60.29	8.4	66.70	57.62	8.4	12.37	28.68	8.4	42.93	8.57	8.4	21.61	46.83
9.3	57.46	60.48	9.4	66.27	57.82	9.4	12.24	29.00	9.4	42.82	8.80	9.4	21.51	47.18
10.3	57.26	60.67	10.4	65.82	58.03	10.4	12.11	29.30	10.4	42.71	9.04	10.4	21.40	47.50
11.3	57.07	60.84	11.4	65.35	58.22	11.4	11.97	29.59	11.4	42.59	9.28	11.4	21.29	47.81
12.3	56.88	60.99	12.4	64.84	58.43	12.4	11.85	29.86	12.4	42.46	9.54	12.4	21.19	48.11
13.3	56.70	61.14	13.4	64.28	58.64	13.4	11.73	30.12	13.4	42.32	9.80	13.4	21.09	48.38
14.3	56.55	61.31	14.4	63.68	58.85	14.4	11.63	30.37	14.4	42.15	10.04	14.4	21.02	48.67
15.3	56.39	61.49	15.4	63.02	59.03	15.4	11.54	30.63	15.4	41.98	10.28	15.4	20.96	48.97
16.3	56.24	61.69	16.4	62.36	59.17	16.4	11.45	30.94	16.4	41.80	10.47	16.4	20.91	49.28
17.3	56.08	61.90	17.4	61.71	59.29	17.4	11.37	31.24	17.4	41.64	10.63	17.4	20.86	49.60
18.3	55.91	62.12	18.4	61.09	59.39	18.4	11.29	31.56	18.4	41.48	10.77	18.4	20.81	49.93
19.3	55.73	62.32	19.4	60.50	59.48	19.4	11.17	31.88	19.4	41.34	10.90	19.4	20.73	50.29
20.3	55.53	62.51	20.4	59.97	59.56	20.4	11.04	32.19	20.4	41.20	11.05	20.4	20.62	50.64
21.3	55.31	62.69	21.3	59.46	59.65	21.4	10.89	32.52	21.4	41.05	11.18	21.4	20.50	51.01
22.3	55.09	62.83	22.3	58.97	59.77	22.4	10.72	32.80	22.4	40.92	11.32	22.4	20.36	51.35
23.3	54.87	62.95	23.3	58.48	59.90	23.4	10.55	33.06	23.4	40.80	11.50	23.4	20.20	51.65
24.3	54.67	63.05	24.3	57.94	60.03	24.4	10.37	33.30	24.4	40.66	11.68	24.4	20.03	51.92
25.3	54.46	63.13	25.3	57.35	60.18	25.4	10.22	33.51	25.4	40.49	11.88	25.4	19.87	52.18
26.3	54.28	63.21	26.3	56.71	60.32	26.4	10.07	33.71	26.4	40.32	12.06	26.4	19.74	52.42
27.3	54.10	63.30	27.3	56.03	60.46	27.4	9.93	33.89	27.4	40.13	12.25	27.4	19.63	52.66
28.3	53.93	63.42	28.3	55.32	60.55	28.4	9.80	34.13	28.4	39.94	12.41	28.4	19.52	52.90
29.3	53.77	63.56	29.3	54.61	60.65	29.3	9.68	34.37	29.4	39.74	12.55	29.4	19.42	53.15
30.3	53.60	63.68	30.3	53.89	60.72	30.3	9.56	34.61	30.3	39.55	12.68	30.4	19.32	53.42
31.3	53.42	63.80	31.3	53.22	60.78	31.3	9.43	34.85	31.3	39.36	12.79	31.4	19.20	53.69
32.3	53.23	63.91	32.3	52.55	60.82	32.3	9.30	35.11	32.3	39.17	12.87	32.4	19.07	53.96
9.81		−9.76	31.25		+31.24	10.78		−10.73	9.36		+9.31	12.37		−12.33
10h 59m 55s.642			12h 14m 28s.053			12h 46m 1s.183			12h 48m 29s.976			13h 27m 5s.514		
−84° 8′ 31″.24			+88° 9′ 56″.03			−84° 40′ 2″.72			+83° 52′ 10″.05			−85° 21′ 23″.59		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			Groombridge 2283. Mag. 7.2			ρ Octantis. Mag. 5.7			ε Ursæ Minoris. Mag. 4.4			59 G. Apo Mag. 5.	
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m
May	14 13	−83 17	May	15 4	+87 33	May	15 24	−84 11	May	16 54	+82 10	May	17 15
	s	″		s	″		s	″		s	″		s
1.5	32.51	21.25	1.5	25.26	11.53	1.5	1.73	27.50	1.6	37.07	19.74	1.6	56.58
2.5	32.56	21.57	2.5	25.18	11.88	2.5	1.85	27.81	2.6	37.13	20.07	2.6	56.71
3.5	32.60	21.92	3.5	25.09	12.19	3.5	1.96	28.13	3.6	37.19	20.39	3.6	56.84
4.5	32.63	22.28	4.5	25.00	12.51	4.5	2.06	28.46	4.6	37.25	20.70	4.6	56.98
5.5	32.65	22.66	5.5	24.92	12.79	5.5	2.17	28.82	5.6	37.30	20.99	5.6	57.10
6.5	32.66	23.03	6.5	24.85	13.07	6.5	2.26	29.18	6.6	37.36	21.25	6.6	57.24
7.5	32.66	23.41	7.5	24.80	13.36	7.5	2.33	29.54	7.6	37.42	21.52	7.6	57.35
8.5	32.65	23.78	8.5	24.75	13.63	8.5	2.39	29.90	8.6	37.47	21.79	8.6	57.46
9.5	32.62	24.14	9.5	24.72	13.93	9.5	2.44	30.27	9.6	37.52	22.06	9.6	57.56
10.5	32.59	24.49	10.5	24.69	14.24	10.5	2.48	30.62	10.6	37.58	22.36	10.6	57.66
11.5	32.57	24.82	11.5	24.64	14.55	11.5	2.51	30.97	11.6	37.65	22.66	11.6	57.74
12.5	32.53	25.11	12.5	24.57	14.88	12.5	2.54	31.28	12.6	37.70	22.97	12.6	57.83
13.5	32.50	25.41	13.5	24.47	15.22	13.5	2.57	31.58	13.6	37.75	23.32	13.6	57.91
14.4	32.49	25.70	14.5	24.33	15.57	14.5	2.61	31.87	14.6	37.80	23.68	14.6	57.99
15.4	32.48	26.01	15.5	24.16	15.91	15.5	2.67	32.17	15.6	37.83	24.05	15.6	58.09
16.4	32.48	26.33	16.5	23.95	16.23	16.5	2.75	32.47	16.6	37.85	24.41	16.6	58.18
17.4	32.48	26.65	17.5	23.72	16.54	17.5	2.83	32.79	17.6	37.86	24.76	17.6	58.31
18.4	32.50	27.02	18.5	23.48	16.81	18.5	2.90	33.12	18.6	37.88	25.10	18.6	58.43
19.4	32.50	27.37	19.5	23.26	17.06	19.5	2.97	33.48	19.5	37.89	25.40	19.6	58.54
20.4	32.47	27.75	20.5	23.05	17.30	20.5	3.02	33.86	20.5	37.90	25.70	20.6	58.65
21.4	32.43	28.12	21.5	22.88	17.54	21.5	3.05	34.23	21.5	37.91	25.98	21.6	58.76
22.4	32.38	28.48	22.5	22.72	17.79	22.5	3.07	34.60	22.5	37.92	26.24	22.6	58.83
23.4	32.30	28.80	23.5	22.58	18.06	23.5	3.06	34.96	23.5	37.94	26.53	23.6	58.90
24.4	32.23	29.09	24.5	22.42	18.33	24.5	3.04	35.29	24.5	37.97	26.84	24.5	58.96
25.4	32.17	29.38	25.5	22.25	18.64	25.5	3.02	35.59	25.5	38.00	27.17	25.5	59.02
26.4	32.10	29.62	26.5	22.03	18.96	26.5	3.00	35.87	26.5	38.02	27.52	26.5	59.08
27.4	32.05	29.89	27.4	21.79	19.27	27.5	3.00	36.16	27.5	38.02	27.89	27.5	59.13
28.4	32.00	30.15	28.4	21.50	19.59	28.5	3.01	36.45	28.5	38.02	28.27	28.5	59.20
29.4	31.97	30.42	29.4	21.19	19.89	29.5	3.03	36.72	29.5	38.02	28.64	29.5	59.28
30.4	31.93	30.71	30.4	20.88	20.17	30.5	3.05	37.03	30.5	38.00	29.00	30.5	59.36
31.4	31.90	31.01	31.4	20.56	20.42	31.5	3.07	37.34	31.5	37.98	29.34	31.5	59.44
32.4	31.85	31.32	32.4	20.24	20.66	32.4	3.08	37.68	32.5	37.96	29.63	32.5	59.51
8.56		−8.50	23.44		+23.41	9.88		−9.83	7.34		+7.28	6.24	−
14^h 13^m $18^s.531$			15^h 4^m $0^s.607$			15^h 23^m $43^s.237$			16^h 54^m $31^s.741$			17^h 15^m 4	
−83° 17′ 4″.27			+87° 33′ 24″.43			−84° 11′ 17″.84			+82° 10′ 38″.40			−80° 47′	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Ursæ Minoris.			**χ Octantis.**			**λ Ursæ Minoris.**			**σ Octantis.**			**76 Draconis.**		
Mag. 4.4			Mag. 5.2			Mag. 6.6			Mag. 5.5			Mag. 5.7		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
May	17 59	+86 36	May	18 6	−87 39	May	19 3	+89 0	May	19 27	−89 13	May	20 48	+82 13
	s	″		s	″		s	″		s	″		s	″
1.6	24.70	31.68	1.6	19.07	42.95	1.7	39.58	37.68	1.7	49.10	18.41	1.8	40.86	0.33
2.6	24.93	31.97	2.6	19.62	43.08	2.7	40.60	37.88	2.7	50.86	18.41	2.8	41.03	0.43
3.6	25.13	32.24	3.6	20.17	43.23	3.7	41.54	38.08	3.7	52.67	18.44	3.8	41.19	0.53
4.6	25.33	32.51	4.6	20.74	43.40	4.7	42.43	38.28	4.7	54.53	18.49	4.8	41.35	0.63
5.6	25.52	32.75	5.6	21.31	43.58	5.7	43.29	38.48	5.7	56.43	18.53	5.7	41.50	0.71
6.6	25.71	33.00	6.6	21.87	43.78	6.7	44.12	38.67	6.7	58.32	18.62	6.7	41.65	0.78
7.6	25.90	33.24	7.6	22.39	44.01	7.7	44.96	38.85	7.7	60.19	18.72	7.7	41.79	0.85
8.6	26.10	33.46	8.6	22.89	44.25	8.7	45.83	39.03	8.7	61.99	18.84	8.7	41.93	0.92
9.6	26.30	33.69	9.6	23.37	44.49	9.7	46.72	39.20	9.7	63.75	18.98	9.7	42.08	0.99
10.6	26.51	33.93	10.6	23.81	44.73	10.7	47.66	39.38	10.7	65.38	19.11	10.7	42.23	1.07
11.6	26.73	34.17	11.6	24.22	44.96	11.7	48.63	39.57	11.7	66.93	19.25	11.7	42.39	1.14
12.6	26.95	34.45	12.6	24.62	45.18	12.7	49.62	39.77	12.7	68.43	19.37	12.7	42.56	1.23
13.6	27.16	34.74	13.6	25.02	45.38	13.7	50.62	39.99	13.7	69.87	19.47	13.7	42.72	1.33
14.6	27.35	35.06	14.6	25.42	45.57	14.6	51.58	40.25	14.7	71.34	19.56	14.7	42.89	1.46
15.6	27.52	35.38	15.6	25.85	45.75	15.6	52.47	40.52	15.7	72.84	19.66	15.7	43.06	1.63
16.6	27.67	35.73	16.6	26.30	45.93	16.6	53.28	40.80	16.7	74.43	19.72	16.7	43.22	1.81
17.6	27.78	36.06	17.6	26.79	46.11	17.6	53.98	41.07	17.7	76.11	19.80	17.7	43.37	1.99
18.6	27.88	36.39	18.6	27.30	46.32	18.6	54.59	41.34	18.7	77.88	19.89	18.7	43.52	2.19
19.6	27.97	36.67	19.6	27.82	46.56	19.6	55.13	41.61	19.7	79.72	20.01	19.7	43.66	2.36
20.6	28.06	36.95	20.6	28.31	46.81	20.6	55.67	41.87	20.6	81.54	20.17	20.7	43.78	2.53
21.6	28.16	37.20	21.6	28.77	47.09	21.6	56.23	42.10	21.6	83.31	20.35	21.7	43.91	2.69
22.6	28.28	37.46	22.6	29.19	47.38	22.6	56.84	42.32	22.6	84.96	20.54	22.7	44.03	2.84
23.6	28.40	37.72	23.6	29.56	47.68	23.6	57.52	42.55	23.6	86.46	20.73	23.7	44.17	2.96
24.6	28.54	37.99	24.6	29.90	47.95	24.6	58.26	42.79	24.6	87.84	20.91	24.7	44.30	3.10
25.6	28.68	38.30	25.6	30.18	48.22	25.6	59.06	43.04	25.6	89.12	21.09	25.7	44.45	3.26
26.6	28.82	38.63	26.6	30.47	48.45	26.6	59.84	43.31	26.6	90.34	21.25	26.7	44.60	3.44
27.6	28.94	38.97	27.6	30.78	48.69	27.6	60.58	43.61	27.6	91.59	21.41	27.7	44.76	3.65
28.6	29.04	39.34	28.6	31.10	48.89	28.6	61.25	43.92	28.6	92.87	21.55	28.7	44.92	3.87
29.6	29.10	39.70	29.6	31.45	49.12	29.6	61.84	44.24	29.6	94.22	21.69	29.7	45.06	4.10
30.6	29.16	40.06	30.6	31.81	49.34	30.6	62.36	44.57	30.6	95.63	21.83	30.7	45.20	4.34
31.6	29.21	40.40	31.6	32.19	49.57	31.6	62.81	44.88	31.6	97.10	21.99	31.7	45.34	4.59
32.6	29.24	40.74	32.6	32.56	49.84	32.6	63.20	45.19	32.6	98.59	22.16	32.7	45.47	4.83
	16.91	+16.88		24.52	−24.50		57.95	+57.94		73.66	−73.65		7.38	+7.32
17^h	59^m	20^s.805	18^h	5^m	36^s.163	19^h	3^m	51^s.560	19^h	26^m	7^s.189	20^h	48^m	44^s.660
+86°	36′	51″.19	−87°	39′	52″.21	+89°	0′	56″.70	−89°	13′	35″.99	+82°	13′	16″.38

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			**υ Octantis.** Mag. 5.7			**β Octantis.** Mag. 4.3			**39 H. Cephei.** Mag. 5.6			**γ¹ Octantis.** Mag. 5.1		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
May	21 38	−83 5	May	22 16	−86 23	May	22 37	−81 48	May	23 27	+86 50	May	23 47	−82 28
	s	″		s	″		s	″		s	″		s	″
1.8	16.00	58.31	1.8	1.50	18.84	1.8	34.77	55.18	1.9	23.61	34.23	1.9	10.81	43.41
2.8	16.17	58.10	2.8	1.79	18.61	2.8	34.91	54.94	2.9	23.99	34.10	2.9	10.90	43.10
3.8	16.35	57.93	3.8	2.12	18.38	3.8	35.04	54.69	3.9	24.36	33.96	3.9	11.00	42.78
4.8	16.56	57.75	4.8	2.45	18.15	4.8	35.18	54.42	4.9	24.70	33.85	4.9	11.13	42.43
5.8	16.78	57.59	5.8	2.82	17.94	5.8	35.35	54.16	5.9	25.04	33.74	5.9	11.26	42.10
6.8	17.00	57.44	6.8	3.19	17.75	6.8	35.51	53.92	6.9	25.36	33.61	6.9	11.39	41.77
7.8	17.22	57.32	7.8	3.57	17.57	7.8	35.67	53.70	7.9	25.66	33.48	7.9	11.53	41.46
8.8	17.43	57.22	8.8	3.95	17.42	8.8	35.84	53.51	8.8	25.97	33.36	8.9	11.68	41.18
9.8	17.63	57.11	9.8	4.34	17.26	9.8	36.00	53.33	9.8	26.28	33.23	9.9	11.83	40.91
10.8	17.84	57.03	10.8	4.70	17.14	10.8	36.16	53.18	10.8	26.59	33.08	10.9	11.97	40.66
11.8	18.03	56.98	11.8	5.04	17.01	11.8	36.31	53.01	11.8	26.92	32.94	11.9	12.10	40.42
12.8	18.22	56.91	12.8	5.37	16.89	12.8	36.46	52.85	12.8	27.28	32.81	12.9	12.21	40.18
13.8	18.39	56.82	13.8	5.69	16.77	13.8	36.59	52.69	13.8	27.67	32.67	13.9	12.32	39.94
14.8	18.56	56.73	14.8	5.98	16.63	14.8	36.72	52.51	14.8	28.08	32.57	14.8	12.43	39.70
15.8	18.73	56.61	15.8	6.29	16.48	15.8	36.86	52.34	15.8	28.50	32.47	15.8	12.55	39.44
16.8	18.92	56.48	16.8	6.61	16.31	16.8	36.99	52.14	16.8	28.94	32.41	16.8	12.68	39.17
17.7	19.10	56.35	17.8	6.94	16.14	17.8	37.14	51.94	17.8	29.36	32.38	17.8	12.81	38.90
18.7	19.33	56.22	18.8	7.32	15.96	18.8	37.32	51.71	18.8	29.75	32.35	18.8	12.94	38.58
19.7	19.56	56.11	19.8	7.71	15.79	19.8	37.49	51.50	19.8	30.13	32.32	19.8	13.09	38.28
20.7	19.79	56.03	20.8	8.14	15.65	20.8	37.67	51.32	20.8	30.47	32.30	20.8	13.27	38.00
21.7	20.03	55.98	21.8	8.54	15.54	21.8	37.86	51.16	21.8	30.79	32.28	21.8	13.45	37.74
22.7	20.25	55.95	22.8	8.95	15.45	22.8	38.05	51.03	22.8	31.12	32.24	22.8	13.61	37.52
23.7	20.46	55.94	23.8	9.34	15.40	23.8	38.21	50.93	23.8	31.45	32.18	23.8	13.77	37.32
24.7	20.64	55.93	24.8	9.69	15.34	24.8	38.37	50.83	24.8	31.81	32.11	24.8	13.93	37.13
25.7	20.83	55.93	25.8	10.03	15.29	25.8	38.52	50.76	25.8	32.20	32.04	25.8	14.08	36.95
26.7	21.00	55.93	26.7	10.35	15.24	26.8	38.66	50.67	26.8	32.61	31.97	26.8	14.21	36.78
27.7	21.17	55.90	27.7	10.66	15.18	27.8	38.80	50.57	27.8	33.05	31.93	27.8	14.34	36.61
28.7	21.34	55.86	28.7	10.97	15.10	28.8	38.93	50.44	28.8	33.49	31.92	28.8	14.46	36.42
29.7	21.52	55.81	29.7	11.29	15.01	29.8	39.07	50.31	29.8	33.93	31.92	29.8	14.59	36.22
30.7	21.71	55.76	30.7	11.62	14.92	30.8	39.23	50.19	30.8	34.38	31.94	30.8	14.74	36.01
31.7	21.90	55.72	31.7	11.98	14.83	31.8	39.39	50.07	31.8	34.79	31.97	31.8	14.88	35.79
32.7	22.11	55.70	32.7	12.35	14.76	32.7	39.57	49.94	32.8	35.18	32.02	32.8	15.04	35.58
8.32 −8.26			15.87 −15.84			7.02 −6.95			18.15 +18.13			7.64 −7.57		
21^h 38^m $10^s.025$			22^h 15^m $56^s.333$			22^h 37^m $32^s.703$			23^h 27^m $44^s.392$			23^h 47^m $12^s.813$		
−83° 6′ 23″.31			−86° 23′ 45″.22			−81° 49′ 21″.11			+86° 50′ 39″.03			−82° 29′ 8″.43		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			**α Ursæ Minoris.** (*Polaris.*) Mag. 2.1			**4 G. Octantis.** Mag. 5.6			**Groombridge 750.** Mag. 6.7			**Groombridge 944.** Mag. 6.4		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
June	0 56	+85 48	June	1 29	+88 51	June	1 41	−85 11	June	4 9	+85 20	June	5 34	+85 9
	s	″		s	″		s	″		s	″		s	″
0.8	53.22	22.98	0.9	6.75	23.90	0.9	55.57	10.75	0.9	39.04	7.63	1.0	50.86	37.68
1.8	53.52	22.91	1.9	7.73	23.78	1.9	55.71	10.43	1.9	39.17	7.35	2.0	50.90	37.38
2.8	53.80	22.84	2.9	8.66	23.67	2.9	55.87	10.11	2.9	39.30	7.11	3.0	50.93	37.08
3.8	54.06	22.75	3.9	9.54	23.55	3.9	56.05	9.79	3.9	39.40	6.86	4.0	50.94	36.82
4.8	54.32	22.67	4.9	10.40	23.42	4.9	56.23	9.49	4.9	39.51	6.62	5.0	50.96	36.56
5.8	54.57	22.59	5.9	11.24	23.30	5.9	56.43	9.21	5.9	39.60	6.36	6.0	50.98	36.31
6.8	54.82	22.51	6.9	12.08	23.16	6.9	56.61	8.93	6.9	39.69	6.11	7.0	50.99	36.03
7.8	55.07	22.41	7.8	12.95	23.01	7.9	56.81	8.69	7.9	39.78	5.85	8.0	50.99	35.73
8.8	55.34	22.31	8.8	13.87	22.87	8.9	57.00	8.44	8.9	39.87	5.56	9.0	50.99	35.41
9.8	55.64	22.19	9.8	14.86	22.71	9.9	57.17	8.23	9.9	39.99	5.26	10.0	51.00	35.09
10.8	55.96	22.09	10.8	15.93	22.56	10.9	57.32	8.00	10.9	40.13	4.95	11.0	51.02	34.75
11.8	56.29	22.02	11.8	17.08	22.45	11.8	57.48	7.75	11.9	40.27	4.64	12.0	51.08	34.39
12.8	56.63	21.98	12.8	18.27	22.34	12.8	57.62	7.54	12.9	40.45	4.34	13.0	51.15	34.04
13.8	56.98	21.96	13.8	19.48	22.24	13.8	57.76	7.29	13.9	40.64	4.06	14.0	51.25	33.70
14.8	57.32	21.95	14.8	20.67	22.19	14.8	57.94	7.03	14.9	40.86	3.81	15.0	51.36	33.39
15.8	57.66	21.96	15.8	21.82	22.15	15.8	58.11	6.73	15.9	41.06	3.59	15.9	51.49	33.10
16.8	57.95	21.99	16.8	22.87	22.12	16.8	58.31	6.45	16.9	41.27	3.41	16.9	51.60	32.82
17.8	58.24	22.03	17.8	23.86	22.09	17.8	58.51	6.17	17.9	41.46	3.19	17.9	51.71	32.57
18.8	58.50	22.05	18.8	24.78	22.06	18.8	58.74	5.92	18.9	41.61	2.99	18.9	51.80	32.32
19.8	58.76	22.04	19.8	25.70	22.01	19.8	59.00	5.69	19.9	41.76	2.78	19.9	51.86	32.08
20.8	59.03	22.01	20.8	26.65	21.96	20.8	59.23	5.48	20.9	41.90	2.55	20.9	51.92	31.80
21.8	59.31	21.97	21.8	27.65	21.88	21.8	59.46	5.32	21.9	42.05	2.32	21.9	51.98	31.50
22.8	59.62	21.94	22.8	28.73	21.79	22.8	59.65	5.16	22.9	42.22	2.05	22.9	52.05	31.18
23.8	59.95	21.91	23.8	29.88	21.70	23.8	59.86	5.01	23.9	42.39	1.78	23.9	52.13	30.85
24.8	60.29	21.91	24.8	31.10	21.63	24.8	60.04	4.86	24.9	42.59	1.50	24.9	52.23	30.51
25.8	60.66	21.93	25.8	32.36	21.60	25.8	60.21	4.69	25.9	42.82	1.26	25.9	52.35	30.17
26.8	61.01	21.97	26.8	33.61	21.57	26.8	60.39	4.51	26.9	43.05	1.00	26.9	52.49	29.85
27.8	61.35	22.03	27.8	34.83	21.57	27.8	60.59	4.31	27.9	43.30	0.77	27.9	52.65	29.56
28.8	61.68	22.11	28.8	36.01	21.60	28.8	60.81	4.11	28.9	43.53	0.57	28.9	52.81	29.27
29.8	61.99	22.19	29.8	37.15	21.64	29.8	61.04	3.92	29.9	43.78	0.38	29.9	52.96	29.00
30.8	62.28	22.26	30.8	38.22	21.65	30.8	61.27	3.73	30.9	44.00	0.21	30.9	53.11	28.76
31.8	62.57	22.34	31.8	39.26	21.67	31.8	61.51	3.54	31.9	44.22	0.03	31.9	53.26	28.52
13.67 +13.64			50.10 +50.09			11.91 −11.87			12.29 +12.25			11.85 +11.81		
0^h 57^m $1^s.657$			1^h 29^m $44^s.254$			1^h 42^m $6^s.102$			4^h 9^m $44^s.952$			5^h 34^m $54^s.014$		
+85° 48′ 25″.87			+88° 51′ 25″.03			−85° 11′ 39″.58			+85° 20′ 1″.04			+85° 9′ 28″.07		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Mensæ. Mag. 6.2			**ζ Mensæ.** Mag. 5.6			**51 H. Cephei.** Mag. 5.3			**25 H. Camelop.** Mag. 5.1			**7 G. Octantis.** Mag. 6.4		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
June	5 46	−84 49	June	6 46	−80 43	June	7 1	+87 11	June	7 13	+82 34	June	7 15	−86 54
	s	″		s	″		s	″		s	″		s	″
1.0	4.02	48.14	1.1	52.40	42.92	1.1	33.49	11.53	1.1	30.54	47.75	1.1	64.74	12.79
2.0	3.89	47.83	2.1	52.30	42.69	2.1	33.38	11.24	2.1	30.50	47.48	2.1	64.40	12.57
3.0	3.78	47.50	3.1	52.21	42.41	3.1	33.28	10.96	3.1	30.47	47.22	3.1	64.05	12.35
4.0	3.67	47.18	4.1	52.13	42.11	4.1	33.18	10.69	4.1	30.44	46.98	4.1	63.72	12.11
5.0	3.57	46.84	5.1	52.04	41.81	5.1	33.06	10.44	5.1	30.38	46.73	5.1	63.42	11.86
6.0	3.49	46.50	6.1	51.96	41.50	6.1	32.93	10.20	6.1	30.33	46.48	6.1	63.13	11.60
7.0	3.41	46.16	7.1	51.89	41.18	7.1	32.79	9.92	7.1	30.28	46.25	7.1	62.85	11.32
8.0	3.35	45.83	8.1	51.83	40.90	8.1	32.64	9.66	8.1	30.22	46.00	8.1	62.60	11.06
9.0	3.30	45.52	9.1	51.77	40.62	9.1	32.50	9.37	9.1	30.16	45.73	9.1	62.37	10.81
10.0	3.24	45.23	10.1	51.71	40.33	10.1	32.32	9.05	10.1	30.09	45.44	10.1	62.14	10.57
11.0	3.18	44.94	11.1	51.66	40.10	11.1	32.17	8.74	11.1	30.02	45.12	11.1	61.93	10.35
12.0	3.11	44.68	12.1	51.60	39.86	12.1	32.07	8.38	12.1	29.98	44.80	12.1	61.71	10.15
13.0	3.03	44.41	13.1	51.54	39.62	13.1	32.00	8.01	13.1	29.96	44.45	13.1	61.47	9.96
14.0	2.95	44.12	14.1	51.48	39.39	14.1	31.99	7.66	14.1	29.95	44.10	14.1	61.19	9.76
15.0	2.87	43.81	15.0	51.40	39.12	15.1	31.99	7.32	15.1	29.94	43.75	15.1	60.91	9.53
16.0	2.78	43.50	16.0	51.32	38.82	16.1	32.03	6.98	16.1	29.96	43.46	16.1	60.63	9.28
17.0	2.71	43.17	17.0	51.27	38.51	17.1	32.06	6.69	17.1	29.98	43.17	17.1	60.33	9.00
17.9	2.66	42.80	18.0	51.21	38.18	18.1	32.09	6.41	18.1	29.98	42.89	18.1	60.07	8.72
18.9	2.61	42.42	19.0	51.15	37.83	19.1	32.09	6.14	19.1	29.99	42.65	19.1	59.83	8.39
19.9	2.59	42.07	20.0	51.10	37.50	20.0	32.05	5.88	20.1	29.98	42.41	20.1	59.63	8.08
20.9	2.58	41.73	21.0	51.05	37.16	21.0	32.00	5.60	21.1	29.95	42.14	21.1	59.45	7.77
21.9	2.58	41.40	22.0	51.02	36.84	22.0	31.94	5.29	22.0	29.91	41.86	22.1	59.31	7.47
22.9	2.58	41.08	23.0	51.00	36.56	23.0	31.87	4.95	23.0	29.88	41.53	23.0	59.17	7.23
23.9	2.58	40.80	24.0	50.97	36.28	24.0	31.82	4.59	24.0	29.87	41.19	24.0	59.03	6.97
24.9	2.57	40.54	25.0	50.94	36.02	25.0	31.81	4.24	25.0	29.86	40.85	25.0	58.89	6.72
25.9	2.56	40.27	26.0	50.91	35.76	26.0	31.83	3.85	26.0	29.87	40.49	26.0	58.74	6.48
26.9	2.52	39.99	27.0	50.88	35.47	27.0	31.88	3.49	27.0	29.88	40.13	27.0	58.56	6.25
27.9	2.51	39.68	28.0	50.84	35.18	28.0	31.96	3.15	28.0	29.91	39.80	28.0	58.38	5.98
28.9	2.50	39.36	29.0	50.81	34.88	29.0	32.04	2.81	29.0	29.95	39.48	29.0	58.21	5.72
29.9	2.49	39.02	30.0	50.78	34.55	30.0	32.15	2.50	30.0	29.99	39.17	30.0	58.03	5.42
30.9	2.49	38.69	31.0	50.74	34.22	31.0	32.25	2.20	31.0	30.02	38.88	31.0	57.87	5.10
31.9	2.50	38.32	32.0	50.72	33.86	32.0	32.35	1.92	32.0	30.06	38.61	32.0	57.73	4.77
11.09 −11.05			6.21 −6.12			20.36 +20.34			7.74 +7.68			18.51 −18.48		
5h 46m 26s.439			6h 47m 3s.489			7h 1m 34s.861			7h 13m 29s.477			7h 16m 40s.555		
−84° 49′ 48″.17			−80° 43′ 34″.16			+87° 11′ 0″.11			+82° 34′ 36″.50			−86° 54′ 0″.14		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			**ζ Octantis.** Mag. 5.4			**1 H. Draconis.** Mag. 4.6			**ζ Chamæleontis.** Mag. 5.2			**30 H. Camelop.** Mag. 5.3		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
June	8 14	+88 53	June	9 8	−85 20	June	9 25	+81 42	June	9 36	−80 34	June	10 20	+82 59
	s	″		s	″		s	″		s	″		s	″
1.2	54.61	23.14	1.2	50.78	8.47	1.2	17.17	7.45	1.2	18.83	18.66	1.2	63.25	21.18
2.1	54.01	22.91	2.2	50.51	8.42	2.2	17.07	7.28	2.2	18.71	18.64	2.2	63.10	21.07
3.1	53.44	22.68	3.2	50.24	8.34	3.2	16.97	7.12	3.2	18.57	18.61	3.2	62.97	20.97
4.1	52.88	22.45	4.2	49.95	8.26	4.2	16.88	6.97	4.2	18.44	18.57	4.2	62.84	20.90
5.1	52.30	22.23	5.2	49.68	8.15	5.2	16.79	6.82	5.2	18.31	18.50	5.2	62.70	20.81
6.1	51.70	22.01	6.2	49.41	8.02	6.2	16.69	6.69	6.2	18.17	18.41	6.2	62.57	20.73
7.1	51.06	21.80	7.2	49.15	7.88	7.2	16.58	6.56	7.2	18.04	18.30	7.2	62.43	20.67
8.1	50.38	21.57	8.2	48.91	7.75	8.2	16.47	6.43	8.2	17.92	18.18	8.2	62.27	20.60
9.1	49.67	21.33	9.2	48.68	7.61	9.2	16.34	6.28	9.2	17.81	18.07	9.2	62.11	20.52
10.1	48.93	21.07	10.2	48.46	7.50	10.2	16.21	6.11	10.2	17.70	17.97	10.2	61.94	20.41
11.1	48.22	20.77	11.2	48.26	7.40	11.2	16.09	5.93	11.2	17.60	17.88	11.2	61.76	20.29
12.1	47.57	20.44	12.2	48.07	7.29	12.2	15.98	5.70	12.2	17.50	17.82	12.2	61.60	20.15
13.1	46.99	20.13	13.2	47.85	7.23	13.2	15.87	5.46	13.2	17.39	17.75	13.2	61.45	19.97
14.1	46.51	19.81	14.2	47.62	7.15	14.2	15.78	5.21	14.2	17.29	17.70	14.2	61.30	19.76
15.1	46.15	19.47	15.2	47.38	7.06	15.2	15.69	4.95	15.2	17.19	17.64	15.2	61.17	19.57
16.1	45.85	19.15	16.1	47.12	6.98	16.2	15.64	4.70	16.2	17.05	17.57	16.2	61.06	19.36
17.1	45.58	18.87	17.1	46.85	6.83	17.2	15.58	4.47	17.2	16.93	17.48	17.2	60.95	19.17
18.1	45.31	18.61	18.1	46.60	6.67	18.2	15.52	4.26	18.2	16.80	17.35	18.2	60.85	18.99
19.1	45.00	18.34	19.1	46.35	6.48	19.2	15.45	4.06	19.2	16.67	17.21	19.2	60.74	18.85
20.1	44.61	18.09	20.1	46.11	6.26	20.1	15.37	3.87	20.2	16.56	17.02	20.2	60.62	18.71
21.1	44.15	17.82	21.1	45.90	6.08	21.1	15.27	3.68	21.2	16.44	16.84	21.2	60.49	18.56
22.1	43.65	17.55	22.1	45.71	5.87	22.1	15.18	3.46	22.2	16.34	16.67	22.2	60.35	18.43
23.1	43.13	17.25	23.1	45.52	5.69	23.1	15.07	3.24	23.1	16.24	16.49	23.2	60.20	18.25
24.1	42.63	16.93	24.1	45.35	5.51	24.1	14.97	3.00	24.1	16.16	16.33	24.2	60.04	18.07
25.1	42.18	16.58	25.1	45.18	5.36	25.1	14.88	2.72	25.1	16.07	16.19	25.2	59.88	17.86
26.1	41.81	16.24	26.1	45.01	5.20	26.1	14.78	2.45	26.1	15.99	16.07	26.2	59.74	17.63
27.1	41.52	15.89	27.1	44.82	5.05	27.1	14.72	2.15	27.1	15.90	15.94	27.2	59.61	17.39
28.1	41.30	15.54	28.1	44.63	4.88	28.1	14.65	1.85	28.1	15.80	15.80	28.2	59.50	17.15
29.1	41.13	15.19	29.1	44.43	4.71	29.1	14.59	1.55	29.1	15.70	15.67	29.2	59.40	16.90
30.1	41.00	14.86	30.1	44.22	4.52	30.1	14.54	1.28	30.1	15.60	15.49	30.2	59.30	16.66
31.1	40.90	14.55	31.1	44.01	4.30	31.1	14.50	1.01	31.1	15.49	15.31	31.2	59.21	16.42
32.1	40.80	14.26	32.1	43.80	4.06	32.1	14.46	0.77	32.1	15.39	15.09	32.2	59.11	16.21
	51.56	+51.55		12.30	−12.26		6.93	+6.86		6.10	−6.02		8.19	+8.13
8^h 14^m $48^s.311$			9^h 9^m $6^s.085$			9^h 25^m $12^s.930$			9^h 36^m $24^s.003$			10^h 20^m $57^s.259$		
+88° 53′ 11″.43			−85° 19′ 42″.77			+81° 41′ 57″.18			−80° 33′ 50″.61			+82° 59′ 12″.27		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

η Octantis. Mag. 6.3			Bradley 1672. Mag. 6.3			ι Octantis. Mag. 5.4			32 H. Camelop. *seq.* Mag. 5.3			κ Octantis. Mag. 5.6		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
June	10 59	−84 9	June	12 14	+88 10	June	12 46	−84 40	June	12 48	+83 52	June	13 27	−85 21
	s	″		s	″		s	″		s	″		s	″
1.3	53.23	3.91	1.3	52.55	0.82	1.3	9.30	35.11	1.3	39.17	12.87	1.4	19.07	53.96
2.3	53.04	4.02	2.3	51.93	0.85	2.3	9.13	35.36	2.3	39.00	12.96	2.4	18.93	54.26
3.3	52.81	4.12	3.3	51.34	0.87	3.3	8.95	35.60	3.3	38.88	13.04	3.4	18.78	54.55
4.3	52.59	4.19	4.3	50.76	0.91	4.3	8.78	35.85	4.3	38.69	13.14	4.4	18.60	54.83
5.3	52.38	4.25	5.3	50.19	0.96	5.3	8.59	36.05	5.3	38.53	13.22	5.4	18.41	55.07
6.3	52.16	4.30	6.3	49.63	1.01	6.3	8.39	36.25	6.3	38.38	13.32	6.4	18.21	55.32
7.2	51.94	4.33	7.3	49.04	1.08	7.3	8.19	36.40	7.3	38.20	13.43	7.4	18.02	55.54
8.2	51.73	4.35	8.3	48.43	1.12	8.3	7.99	36.56	8.3	38.03	13.56	8.4	17.82	55.74
9.2	51.54	4.36	9.3	47.77	1.18	9.3	7.80	36.71	9.3	37.84	13.69	9.3	17.62	55.92
10.2	51.35	4.36	10.3	47.06	1.24	10.3	7.63	36.83	10.3	37.65	13.81	10.3	17.46	56.12
11.2	51.17	4.39	11.3	46.32	1.26	11.3	7.48	36.98	11.3	37.42	13.90	11.3	17.31	56.30
12.2	51.01	4.43	12.3	45.56	1.27	12.3	7.33	37.14	12.3	37.22	13.96	12.3	17.16	56.49
13.2	50.84	4.48	13.3	44.81	1.25	13.3	7.18	37.31	13.3	37.01	14.02	13.3	17.02	56.71
14.2	50.66	4.54	14.3	44.08	1.21	14.3	7.04	37.49	14.3	36.80	14.04	14.3	16.89	56.95
15.2	50.48	4.61	15.3	43.39	1.15	15.3	6.88	37.69	15.3	36.60	14.04	15.3	16.73	57.17
16.2	50.28	4.66	16.3	42.75	1.07	16.3	6.70	37.90	16.3	36.41	14.03	16.3	16.56	57.44
17.2	50.05	4.70	17.3	42.16	1.00	17.3	6.50	38.09	17.3	36.24	14.01	17.3	16.37	57.68
18.2	49.83	4.71	18.3	41.60	0.95	18.3	6.29	38.26	18.3	36.09	14.00	18.3	16.14	57.91
19.2	49.60	4.69	19.3	41.05	0.93	19.3	6.06	38.41	19.3	35.93	14.01	19.3	15.91	58.12
20.2	49.38	4.64	20.3	40.46	0.89	20.3	5.83	38.51	20.3	35.75	14.03	20.3	15.66	58.30
21.2	49.17	4.58	21.3	39.84	0.89	21.3	5.62	38.60	21.3	35.57	14.08	21.3	15.43	58.44
22.2	48.98	4.52	22.3	39.18	0.87	22.3	5.41	38.68	22.3	35.38	14.13	22.3	15.22	58.56
23.2	48.81	4.46	23.3	38.47	0.86	23.3	5.22	38.76	23.3	35.17	14.16	23.3	15.02	58.68
24.2	48.64	4.41	24.3	37.73	0.82	24.3	5.04	38.82	24.3	34.95	14.20	24.3	14.83	58.80
25.2	48.48	4.37	25.3	36.97	0.76	25.3	4.86	38.91	25.3	34.72	14.20	25.3	14.65	58.92
26.2	48.32	4.33	26.3	36.22	0.67	26.3	4.71	39.01	26.3	34.50	14.18	26.3	14.48	59.05
27.2	48.15	4.32	27.2	35.50	0.58	27.3	4.54	39.12	27.3	34.30	14.15	27.3	14.30	59.19
28.2	47.97	4.29	28.2	34.82	0.48	28.3	4.36	39.24	28.3	34.09	14.09	28.3	14.12	59.36
29.2	47.78	4.25	29.2	34.17	0.35	29.3	4.17	39.35	29.3	33.90	14.03	29.3	13.91	59.53
30.2	47.58	4.21	30.2	33.56	0.22	30.3	3.97	39.44	30.3	33.71	13.96	30.3	13.69	59.68
31.2	47.38	4.13	31.2	32.97	0.11	31.3	3.74	39.52	31.3	33.54	13.89	31.3	13.46	59.82
32.2	47.17	4.06	32.2	32.40	0.01	32.3	3.52	39.59	32.3	33.37	13.82	32.3	13.21	59.96
	9.81	−9.76		31.26	+31.25		10.78	−10.73		9.37	+9.31		12.38	−12.34
10h	59m	55s.642	12h	14m	28s.053	12h	46m	1s.183	12h	48m	29s.976	13h	27m	5s.514
−84°	8′	31″.24	+88°	9′	56″.03	−84°	40′	2″.72	+83°	52′	10″.05	−85°	21′	23″.59

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			**Groombridge 2283.** Mag. 7.2			**ρ Octantis.** Mag. 5.7			**ε Ursæ Minoris.** Mag. 4.4			**59 G. Apodis.** Mag. 5.9		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
June	14 13	−83 17	June	15 4	+87 33	June	15 24	−84 11	June	16 54	+82 10	June	17 15	−80 47
	s	″		s	″		s	″		s	″		s	″
1.4	31.85	31.32	1.4	20.24	20.66	1.4	3.08	37.68	1.5	37.96	29.63	1.5	59.51	7.90
2.4	31.80	31.63	2.4	19.94	20.89	2.4	3.09	38.02	2.5	37.94	29.98	2.5	59.58	8.21
3.4	31.72	31.95	3.4	19.64	21.11	3.4	3.07	38.37	3.5	37.92	30.28	3.5	59.65	8.53
4.4	31.64	32.25	4.4	19.35	21.33	4.4	3.04	38.72	4.5	37.90	30.57	4.5	59.72	8.84
5.4	31.55	32.54	5.4	19.09	21.56	5.4	3.00	39.06	5.5	37.87	30.85	5.5	59.76	9.16
6.4	31.45	32.83	6.4	18.83	21.80	6.4	2.95	39.37	6.5	37.86	31.15	6.5	59.81	9.48
7.4	31.34	33.08	7.4	18.57	22.02	7.4	2.89	39.67	7.5	37.84	31.46	7.5	59.84	9.79
8.4	31.23	33.33	8.4	18.28	22.28	8.4	2.82	39.96	8.5	37.82	31.77	8.5	59.86	10.09
9.4	31.13	33.58	9.4	17.97	22.55	9.4	2.76	40.24	9.5	37.80	32.11	9.5	59.88	10.36
10.4	31.03	33.79	10.4	17.64	22.82	10.4	2.70	40.50	10.5	37.77	32.47	10.5	59.91	10.61
11.4	30.96	34.00	11.4	17.26	23.08	11.4	2.66	40.75	11.5	37.73	32.83	11.5	59.94	10.86
12.4	30.89	34.21	12.4	16.85	23.34	12.4	2.64	41.01	12.5	37.68	33.17	12.5	59.99	11.10
13.4	30.83	34.46	13.4	16.41	23.58	13.4	2.62	41.27	13.5	37.62	33.52	13.5	60.04	11.35
14.4	30.76	34.72	14.4	15.97	23.79	14.4	2.60	41.56	14.5	37.55	33.86	14.5	60.09	11.61
15.4	30.70	35.00	15.4	15.53	23.98	15.4	2.58	41.88	15.5	37.49	34.17	15.5	60.15	11.91
16.4	30.62	35.29	16.4	15.11	24.14	16.4	2.55	42.20	16.5	37.42	34.46	16.5	60.21	12.22
17.4	30.50	35.58	17.4	14.71	24.28	17.4	2.49	42.52	17.5	37.35	34.71	17.5	60.26	12.54
18.4	30.38	35.84	18.4	14.35	24.42	18.4	2.42	42.85	18.5	37.29	34.97	18.5	60.28	12.88
19.4	30.25	36.08	19.4	14.00	24.58	19.4	2.33	43.16	19.5	37.24	35.23	19.5	60.30	13.22
20.3	30.13	36.30	20.4	13.65	24.77	20.4	2.22	43.46	20.5	37.19	35.50	20.5	60.31	13.54
21.3	29.99	36.50	21.4	13.29	24.97	21.4	2.11	43.71	21.5	37.14	35.80	21.5	60.30	13.84
22.3	29.85	36.66	22.4	12.90	25.17	22.4	2.01	43.94	22.5	37.08	36.11	22.5	60.30	14.12
23.3	29.73	36.81	23.4	12.48	25.39	23.4	1.91	44.16	23.5	37.02	36.45	23.5	60.29	14.37
24.3	29.62	36.98	24.4	12.03	25.61	24.4	1.82	44.37	24.4	36.94	36.78	24.5	60.29	14.62
25.3	29.53	37.16	25.4	11.54	25.82	25.4	1.75	44.59	25.4	36.86	37.12	25.5	60.30	14.86
26.3	29.44	37.33	26.4	11.04	26.01	26.4	1.68	44.82	26.4	36.77	37.43	26.5	60.31	15.11
27.3	29.33	37.51	27.4	10.54	26.17	27.4	1.61	45.06	27.4	36.68	37.74	27.5	60.33	15.36
28.3	29.22	37.70	28.4	10.05	26.31	28.4	1.53	45.32	28.4	36.59	38.03	28.5	60.34	15.65
29.3	29.11	37.90	29.4	9.57	26.46	29.4	1.45	45.59	29.4	36.49	38.30	29.5	60.36	15.95
30.3	28.99	38.10	30.4	9.10	26.54	30.4	1.35	45.85	30.4	36.39	38.56	30.4	60.36	16.25
31.3	28.85	38.30	31.4	8.65	26.65	31.4	1.24	46.13	31.4	36.30	38.80	31.4	60.37	16.56
32.3	28.71	38.49	32.4	8.22	26.76	32.4	1.12	46.38	32.4	36.22	39.03	32.4	60.36	16.87
	8.56	−8.50		23.46	+23.44		9.89	−9.84		7.35	+7.28		6.25	−6.17
$14^{h}\ 13^{m}\ 18^{s}.531$			$15^{h}\ 4^{m}\ 0^{s}.607$			$15^{h}\ 23^{m}\ 43^{s}.237$			$16^{h}\ 54^{m}\ 31^{s}.741$			$17^{h}\ 15^{m}\ 43^{s}.730$		
−83° 17′ 4″.27			+87° 33′ 24″.43			−84° 11′ 17″.84			+82° 10′ 38″.40			−80° 47′ 2″.69		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Ursæ Minoris.			χ Octantis.			λ Ursæ Minoris.			σ Octantis.			76 Draconis.		
Mag. 4.4			Mag. 5.2			Mag. 6.6			Mag. 5.5			Mag. 5.7		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
June	17 59	+86 36	June	18 6	−87 39	June	19 4	+89 0	June	19 28	−89 13	June	20 48	+82 13
	s	″		s	″		s	″		s	″		s	″
1.6	29.24	40.74	1.6	32.56	49.84	1.6	3.20	45.19	1.6	38.59	22.16	1.7	45.47	4.83
2.6	29.25	41.05	2.6	32.92	50.12	2.6	3.57	45.48	2.6	40.08	22.35	2.7	45.59	5.07
3.5	29.28	41.34	3.6	33.26	50.43	3.6	3.93	45.76	3.6	41.54	22.55	3.7	45.70	5.29
4.5	29.31	41.63	4.6	33.58	50.74	4.6	4.29	46.04	4.6	42.92	22.77	4.7	45.80	5.50
5.5	29.34	41.92	5.5	33.87	51.06	5.6	4.70	46.32	5.6	44.26	23.02	5.7	45.91	5.71
6.5	29.38	42.19	6.5	34.11	51.37	6.6	5.11	46.59	6.6	45.49	23.27	6.7	46.03	5.91
7.5	29.43	42.50	7.5	34.33	51.68	7.6	5.57	46.86	7.6	46.63	23.51	7.7	46.15	6.13
8.5	29.47	42.81	8.5	34.53	51.97	8.6	6.05	47.14	8.6	47.68	23.74	8.7	46.27	6.35
9.5	29.52	43.14	9.5	34.70	52.24	9.6	6.52	47.45	9.6	48.67	23.96	9.7	46.39	6.59
10.5	29.56	43.50	10.5	34.89	52.51	10.6	6.98	47.78	10.6	49.64	24.17	10.6	46.53	6.85
11.5	29.56	43.86	11.5	35.09	52.76	11.6	7.39	48.12	11.6	50.63	24.37	11.6	46.65	7.14
12.5	29.54	44.24	12.5	35.32	52.99	12.6	7.71	48.47	12.6	51.67	24.55	12.6	46.78	7.45
13.5	29.50	44.62	13.5	35.58	53.24	13.6	7.92	48.83	13.6	52.81	24.73	13.6	46.89	7.76
14.5	29.45	44.97	14.5	35.86	53.50	14.6	8.02	49.19	14.6	54.05	24.93	14.6	46.99	8.10
15.5	29.35	45.31	15.5	36.15	53.78	15.6	8.05	49.53	15.6	55.35	25.14	15.6	47.09	8.42
16.5	29.25	45.63	16.5	36.44	54.08	16.6	8.03	49.85	16.6	56.65	25.37	16.6	47.18	8.72
17.5	29.17	45.91	17.5	36.70	54.40	17.6	8.02	50.14	17.6	57.91	25.63	17.6	47.26	9.01
18.5	29.11	46.19	18.5	36.90	54.75	18.6	8.04	50.44	18.6	59.08	25.90	18.6	47.33	9.29
19.5	29.05	46.46	19.5	37.06	55.10	19.6	8.14	50.73	19.6	60.10	26.20	19.6	47.41	9.53
20.5	29.01	46.75	20.5	37.17	55.43	20.5	8.30	51.02	20.6	60.98	26.48	20.6	47.49	9.80
21.5	28.98	47.07	21.5	37.25	55.75	21.5	8.49	51.32	21.6	61.73	26.76	21.6	47.59	10.06
22.5	28.94	47.40	22.5	37.30	56.04	22.5	8.71	51.64	22.6	62.39	27.04	22.6	47.69	10.32
23.5	28.90	47.74	23.5	37.36	56.32	23.5	8.90	52.00	23.6	63.03	27.29	23.6	47.79	10.62
24.5	28.82	48.13	24.5	37.44	56.58	24.5	9.04	52.37	24.6	63.70	27.51	24.6	47.89	10.94
25.5	28.73	48.51	25.5	37.54	56.83	25.5	9.11	52.73	25.6	64.42	27.73	25.6	47.99	11.30
26.5	28.61	48.87	26.5	37.66	57.09	26.5	9.07	53.10	26.5	65.19	27.96	26.6	48.08	11.66
27.5	28.48	49.21	27.5	37.79	57.37	27.5	8.97	53.45	27.5	66.02	28.20	27.6	48.16	12.02
28.5	28.33	49.53	28.5	37.93	57.66	28.5	8.80	53.80	28.5	66.88	28.44	28.6	48.22	12.37
29.5	28.18	49.83	29.5	38.05	57.96	29.5	8.59	54.15	29.5	67.74	28.70	29.6	48.28	12.71
30.5	28.03	50.15	30.5	38.15	58.28	30.5	8.35	54.47	30.5	68.57	28.99	30.6	48.34	13.04
31.5	27.88	50.43	31.5	38.23	58.62	31.5	8.14	54.79	31.5	69.35	29.29	31.6	48.40	13.37
32.5	27.74	50.71	32.5	38.28	58.96	32.5	7.94	55.09	32.5	70.06	29.60	32.6	48.45	13.67
	16.92	+16.89		24.54	−24.52		58.10	+58.09		73.80	−73.80		7.39	+7.32
	17ʰ 59ᵐ 20ˢ.805			18ʰ 5ᵐ 36ˢ.163			19ʰ 3ᵐ 51ˢ.560			19ʰ 26ᵐ 7ˢ.189			20ʰ 48ᵐ 44ˢ.660	
		+86° 36′ 51″.19			−87° 39′ 52″.21			+89° 0′ 56″.70			−89° 13′ 35″.99			+82° 13′ 16″.38

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			υ Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ¹ Octantis. Mag. 5.1		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
June	21 38	−83 5	June	22 16	−86 23	June	22 37	−81 48	June	23 27	+86 50	June	23 47	−82 28
	s	″		s	″		s	″		s	″		s	″
1.7	22.11	55.70	1.7	12.35	14.76	1.7	39.57	49.94	1.8	35.18	32.02	1.8	15.04	35.58
2.7	22.32	55.70	2.7	12.74	14.69	2.7	39.74	49.83	2.8	35.56	32.07	2.8	15.22	35.38
3.7	22.53	55.69	3.7	13.14	14.63	3.7	39.93	49.75	3.8	35.92	32.10	3.8	15.40	35.20
4.7	22.75	55.71	4.7	13.54	14.62	4.7	40.11	49.69	4.8	36.26	32.13	4.8	15.58	35.02
5.7	22.96	55.77	5.7	13.95	14.63	5.7	40.29	49.64	5.8	36.61	32.15	5.8	15.76	34.87
6.7	23.16	55.84	6.7	14.31	14.64	6.7	40.46	49.62	6.8	36.96	32.16	6.8	15.94	34.72
7.7	23.34	55.91	7.7	14.67	14.66	7.7	40.62	49.60	7.8	37.33	32.16	7.8	16.10	34.62
8.7	23.52	55.98	8.7	15.01	14.68	8.7	40.78	49.57	8.8	37.72	32.18	8.8	16.26	34.51
9.7	23.69	56.03	9.7	15.33	14.70	9.7	40.92	49.56	9.8	38.13	32.21	9.8	16.41	34.40
10.7	23.85	56.09	10.7	15.64	14.71	10.7	41.06	49.53	10.8	38.55	32.26	10.8	16.56	34.30
11.7	24.01	56.14	11.7	15.94	14.70	11.7	41.19	49.49	11.8	38.99	32.32	11.8	16.70	34.19
12.7	24.18	56.16	12.7	16.25	14.69	12.7	41.33	49.44	12.8	39.44	32.40	12.8	16.84	34.07
13.7	24.35	56.18	13.7	16.57	14.68	13.7	41.48	49.37	13.8	39.88	32.52	13.8	16.99	33.93
14.7	24.53	56.19	14.7	16.92	14.65	14.7	41.65	49.32	14.7	40.31	32.65	14.8	17.15	33.77
15.7	24.73	56.21	15.7	17.29	14.63	15.7	41.83	49.25	15.7	40.70	32.79	15.8	17.33	33.62
16.7	24.94	56.25	16.7	17.69	14.62	16.7	42.01	49.21	16.7	41.06	32.95	16.8	17.52	33.46
17.7	25.16	56.34	17.7	18.09	14.64	17.7	42.20	49.18	17.7	41.40	33.08	17.8	17.70	33.33
18.7	25.37	56.42	18.7	18.49	14.70	18.7	42.39	49.18	18.7	41.73	33.19	18.8	17.90	33.24
19.7	25.57	56.55	19.7	18.88	14.79	19.7	42.57	49.21	19.7	42.05	33.30	19.7	18.10	33.16
20.7	25.75	56.70	20.7	19.22	14.88	20.7	42.72	49.27	20.7	42.38	33.38	20.7	18.28	33.11
21.7	25.90	56.83	21.7	19.55	14.98	21.7	42.87	49.32	21.7	42.76	33.47	21.7	18.44	33.07
22.7	26.05	56.95	22.7	19.83	15.07	22.7	43.01	49.38	22.7	43.16	33.56	22.7	18.59	33.05
23.6	26.19	57.06	23.7	20.11	15.16	23.7	43.14	49.44	23.7	43.57	33.66	23.7	18.74	33.02
24.6	26.33	57.18	24.7	20.39	15.23	24.7	43.27	49.48	24.7	44.00	33.79	24.7	18.88	32.97
25.6	26.47	57.27	25.7	20.67	15.29	25.7	43.40	49.51	25.7	44.42	33.94	25.7	19.03	32.92
26.6	26.62	57.36	26.7	20.96	15.34	26.7	43.54	49.53	26.7	44.84	34.11	26.7	19.18	32.86
27.6	26.79	57.46	27.7	21.28	15.39	27.7	43.69	49.55	27.7	45.23	34.29	27.7	19.34	32.80
28.6	26.96	57.57	28.7	21.61	15.48	28.7	43.85	49.57	28.7	45.61	34.48	28.7	19.51	32.73
29.6	27.13	57.69	29.7	21.95	15.56	29.7	44.02	49.61	29.7	45.97	34.67	29.7	19.69	32.67
30.6	27.31	57.82	30.7	22.30	15.64	30.7	44.19	49.66	30.7	46.30	34.88	30.7	19.88	32.63
31.6	27.49	57.97	31.7	22.65	15.75	31.7	44.35	49.73	31.7	46.62	35.07	31.7	20.06	32.62
32.6	27.65	58.15	32.6	22.99	15.89	32.7	44.50	49.81	32.7	46.93	35.25	32.7	20.24	32.61
8.32		−8.26	15.87		−15.84	7.02		−6.95	18.15		+18.13	7.64		−7.57
21^h 38^m $10^s.025$			22^h 15^m $56^s.333$			22^h 37^m $32^s.703$			23^h 27^m $44^s.392$			23^h 47^m $12^s.813$		
−83° 6′ 23″.31			−86° 23′ 45″.22			−81° 49′ 21″.11			+86° 50′ 39″.03			−82° 29′ 8″.43		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			**α Ursæ Minoris.** (*Polaris.*) Mag. 2.1			**4 G. Octantis.** Mag. 5.6			**Groombridge 750.** Mag. 6.7			**Groombridge 944.** Mag. 6.4		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
July	0 57	+85 48	July	1 29	+88 51	July	1 42	−85 11	July	4 9	+85 19	July	5 34	+85 9
	s	″		s	″		s	″		s	″		s	″
0.8	2.28	22.26	0.8	38.22	21.65	0.8	1.27	3.73	0.9	44.00	60.21	0.9	53.11	28.76
1.8	2.57	22.34	1.8	39.26	21.67	1.8	1.51	3.54	1.9	44.22	60.03	1.9	53.26	28.52
2.8	2.85	22.41	2.8	40.28	21.69	2.8	1.78	3.36	2.9	44.42	59.86	2.9	53.39	28.28
3.8	3.12	22.48	3.8	41.26	21.71	3.8	2.04	3.22	3.9	44.62	59.70	3.9	53.52	28.03
4.8	3.40	22.52	4.8	42.26	21.71	4.8	2.29	3.09	4.9	44.81	59.52	4.9	53.66	27.78
5.8	3.68	22.56	5.8	43.30	21.71	5.8	2.54	2.99	5.9	45.01	59.33	5.9	53.77	27.52
6.7	3.99	22.61	6.8	44.39	21.70	6.8	2.78	2.90	6.9	45.22	59.12	6.9	53.89	27.25
7.7	4.30	22.66	7.8	45.55	21.70	7.8	3.00	2.81	7.9	45.44	58.90	7.9	54.03	26.94
8.7	4.63	22.73	8.8	46.79	21.70	8.8	3.22	2.74	8.9	45.68	58.68	8.9	54.17	26.63
9.7	4.99	22.83	9.8	48.07	21.75	9.8	3.42	2.64	9.9	45.95	58.48	9.9	54.35	26.33
10.7	5.35	22.95	10.8	49.38	21.80	10.8	3.61	2.54	10.9	46.23	58.27	10.9	54.55	26.04
11.7	5.69	23.09	11.8	50.67	21.89	11.8	3.83	2.41	11.9	46.53	58.09	11.9	54.78	25.75
12.7	6.03	23.26	12.8	51.91	21.99	12.8	4.05	2.27	12.9	46.85	57.95	12.9	55.01	25.51
13.7	6.35	23.44	13.8	53.05	22.12	13.8	4.29	2.14	13.9	47.14	57.83	13.9	55.24	25.26
14.7	6.63	23.62	14.8	54.17	22.24	14.8	4.55	2.01	14.9	47.43	57.74	14.9	55.46	25.07
15.7	6.91	23.78	15.7	55.18	22.35	15.8	4.83	1.88	15.9	47.68	57.66	15.9	55.67	24.87
16.7	7.16	23.94	16.7	56.16	22.45	16.8	5.11	1.79	16.9	47.93	57.56	16.9	55.86	24.68
17.7	7.42	24.07	17.7	57.13	22.54	17.8	5.38	1.72	17.9	48.17	57.44	17.9	56.03	24.48
18.7	7.69	24.18	18.7	58.15	22.60	18.8	5.64	1.71	18.9	48.39	57.31	18.9	56.21	24.26
19.7	7.98	24.29	19.7	59.24	22.68	19.7	5.89	1.70	19.8	48.63	57.16	19.9	56.37	24.01
20.7	8.29	24.43	20.7	60.40	22.75	20.7	6.12	1.69	20.8	48.89	57.02	20.9	56.54	23.74
21.7	8.62	24.56	21.7	61.64	22.82	21.7	6.35	1.69	21.8	49.16	56.84	21.9	56.76	23.47
22.7	8.95	24.71	22.7	62.88	22.92	22.7	6.56	1.66	22.8	49.45	56.69	22.9	56.99	23.19
23.7	9.28	24.89	23.7	64.14	23.04	23.7	6.77	1.65	23.8	49.77	56.55	23.9	57.20	22.93
24.7	9.61	25.08	24.7	65.38	23.18	24.7	6.99	1.61	24.8	50.07	56.45	24.9	57.45	22.70
25.7	9.92	25.28	25.7	66.57	23.33	25.7	7.22	1.57	25.8	50.39	56.35	25.9	57.70	22.48
26.7	10.21	25.51	26.7	67.71	23.49	26.7	7.47	1.52	26.8	50.71	56.27	26.9	57.96	22.27
27.7	10.49	25.73	27.7	68.78	23.65	27.7	7.72	1.48	27.8	51.01	56.21	27.9	58.21	22.06
28.7	10.76	25.96	28.7	69.80	23.81	28.7	7.99	1.46	28.8	51.30	56.16	28.9	58.46	21.91
29.7	11.01	26.18	29.7	70.78	23.99	29.7	8.26	1.45	29.8	51.58	56.12	29.9	58.70	21.73
30.7	11.25	26.39	30.7	71.73	24.15	30.7	8.54	1.45	30.8	51.86	56.06	30.9	58.93	21.58
31.7	11.49	26.57	31.7	72.68	24.30	31.7	8.81	1.48	31.8	52.10	56.00	31.9	59.14	21.43
13.68 +13.64			50.10 +50.09			11.91 −11.87			12.29 +12.25			11.84 +11.80		
0h 57m 1s.657			1h 29m 44s.254			1h 42m 6s.102			4h 9m 44s.952			5h 34m 54s.014		
+85° 48′ 25″.87			+88° 51′ 25″.03			−85° 11′ 39″.58			+85° 20′ 1″.04			+85° 9′ 28″.07		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Mensæ. Mag. 6.2			**ζ Mensæ.** Mag. 5.6			**51 H. Cephei.** Mag. 5.3			**25 H. Camelop.** Mag. 5.1			**7 G. Octantis.** Mag. 6.4		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
July	5 46	−84 49	July	6 46	−80 43	July	7 1	+87 10	July	7 13	+82 34	July	7 15	−86 53
	s	″		s	″		s	″		s	″		s	″
0.9	2.49	38.69	1.0	50.74	34.22	1.0	32.25	62.20	1.0	30.02	38.88	1.0	57.87	65.10
1.9	2.50	38.32	2.0	50.72	33.86	2.0	32.35	61.92	2.0	30.06	38.61	2.0	57.73	64.77
2.9	2.53	37.96	3.0	50.71	33.53	3.0	32.44	61.63	3.0	30.10	38.32	3.0	57.59	64.45
3.9	2.58	37.61	3.9	50.69	33.17	4.0	32.49	61.37	4.0	30.11	38.06	4.0	57.49	64.11
4.9	2.61	37.27	4.9	50.69	32.83	5.0	32.56	61.08	5.0	30.13	37.79	5.0	57.40	63.78
5.9	2.66	36.94	5.9	50.69	32.49	6.0	32.61	60.76	6.0	30.14	37.50	6.0	57.34	63.47
6.9	2.72	36.64	6.9	50.69	32.17	7.0	32.65	60.44	7.0	30.15	37.18	7.0	57.30	63.16
7.9	2.77	36.36	7.9	50.69	31.87	7.9	32.71	60.10	8.0	30.17	36.84	8.0	57.25	62.86
8.9	2.83	36.10	8.9	50.70	31.59	8.9	32.80	59.75	9.0	30.20	36.48	9.0	57.21	62.61
9.9	2.88	35.84	9.9	50.70	31.33	9.9	32.91	59.39	10.0	30.24	36.12	10.0	57.15	62.35
10.9	2.92	35.57	10.9	50.70	31.05	10.9	33.07	59.02	10.9	30.29	35.76	10.9	57.07	62.07
11.9	2.95	35.29	11.9	50.69	30.77	11.9	33.26	58.64	11.9	30.37	35.41	11.9	56.99	61.83
12.9	2.98	34.98	12.9	50.69	30.48	12.9	33.50	58.29	12.9	30.46	35.07	12.9	56.88	61.55
13.9	3.01	34.66	13.9	50.68	30.16	13.9	33.74	57.96	13.9	30.55	34.77	13.9	56.78	61.24
14.9	3.06	34.32	14.9	50.67	29.80	14.9	33.98	57.67	14.9	30.65	34.48	14.9	56.68	60.91
15.9	3.13	33.98	15.9	50.68	29.44	15.9	34.19	57.38	15.9	30.74	34.22	15.9	56.62	60.57
16.9	3.21	33.64	16.9	50.69	29.06	16.9	34.38	57.11	16.9	30.79	33.95	16.9	56.58	60.22
17.9	3.30	33.31	17.9	50.72	28.72	17.9	34.55	56.85	17.9	30.85	33.69	17.9	56.58	59.87
18.9	3.41	33.02	18.9	50.75	28.37	18.9	34.70	56.58	18.9	30.91	33.40	18.9	56.61	59.55
19.9	3.51	32.73	19.9	50.78	28.06	19.9	34.83	56.25	19.9	30.96	33.09	19.9	56.66	59.25
20.9	3.62	32.47	20.9	50.81	27.78	20.9	34.97	55.92	20.9	31.00	32.78	20.9	56.70	58.97
21.9	3.73	32.24	21.9	50.85	27.51	21.9	35.15	55.58	21.9	31.06	32.43	21.9	56.75	58.71
22.9	3.83	32.01	22.9	50.89	27.24	22.9	35.36	55.22	22.9	31.14	32.08	22.9	56.80	58.47
23.9	3.93	31.77	23.9	50.92	26.95	23.9	35.59	54.88	23.9	31.23	31.73	23.9	56.83	58.20
24.9	4.02	31.52	24.9	50.95	26.68	24.9	35.85	54.55	24.9	31.33	31.40	24.9	56.84	57.94
25.9	4.11	31.25	25.9	50.98	26.41	25.9	36.13	54.22	25.9	31.42	31.07	25.9	56.85	57.66
26.9	4.21	30.98	26.9	51.01	26.09	26.9	36.43	53.92	26.9	31.56	30.78	26.9	56.87	57.35
27.9	4.31	30.70	27.9	51.04	25.78	27.9	36.72	53.64	27.9	31.66	30.49	27.9	56.90	57.03
28.9	4.44	30.40	28.9	51.07	25.45	28.9	37.01	53.36	28.9	31.77	30.22	28.9	56.93	56.72
29.9	4.56	30.10	29.9	51.11	25.13	29.9	37.30	53.12	29.9	31.88	29.98	29.9	56.98	56.38
30.9	4.69	29.80	30.9	51.16	24.79	30.9	37.58	52.86	30.9	31.98	29.71	30.9	57.07	56.05
31.9	4.84	29.51	31.9	51.21	24.47	31.9	37.82	52.62	31.9	32.07	29.45	31.9	57.16	55.70
	11.09	−11.04		6.20	−6.12		20.34	+20.32		7.74	+7.67		18.49	−18.46
5^h 46^m $26^s.439$			6^h 47^m $3^s.489$			7^h 1^m $34^s.861$			7^h 13^m $29^s.477$			7^h 16^m $40^s.555$		
−84° 49′ 48″.17			−80° 43′ 34″.16			+87° 11′ 0″.11			+82° 34′ 36″.50			−86° 54′ 0″.14		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			**ζ Octantis.** Mag. 5.4			**1 H. Draconis.** Mag. 4.6			**ζ Chamæleontis.** Mag. 5.2			**30 H. Camelop.** Mag. 5.3		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
July	8 14	+88 53	July	9 8	−85 19	July	9 25	+81 41	July	9 36	−80 34	July	10 20	+82 59
	s	″		s	″		s	″		s	″		s	″
1.1	40.90	14.55	1.1	44.01	64.30	1.1	14.50	61.01	1.1	15.49	15.31	1.2	59.21	16.42
2.1	40.80	14.26	2.1	43.80	64.06	2.1	14.46	60.77	2.1	15.39	15.09	2.2	59.11	16.21
3.1	40.66	13.97	3.1	43.61	63.83	3.1	14.41	60.51	3.1	15.29	14.87	3.2	59.02	16.01
4.1	40.50	13.68	4.1	43.42	63.56	4.1	14.35	60.26	4.1	15.19	14.64	4.1	58.92	15.80
5.1	40.31	13.39	5.1	43.25	63.32	5.1	14.29	60.03	5.1	15.09	14.40	5.1	58.82	15.61
6.1	40.08	13.08	6.1	43.10	63.06	6.1	14.22	59.79	6.1	15.00	14.16	6.1	58.70	15.39
7.1	39.83	12.76	7.1	42.95	62.83	7.1	14.15	59.52	7.1	14.93	13.93	7.1	58.57	15.16
8.0	39.58	12.43	8.1	42.82	62.60	8.1	14.08	59.23	8.1	14.87	13.72	8.1	58.44	14.92
9.0	39.37	12.06	9.1	42.71	62.38	9.1	14.00	58.92	9.1	14.79	13.51	9.1	58.32	14.65
10.0	39.24	11.67	10.1	42.58	62.19	10.1	13.94	58.59	10.1	14.73	13.30	10.1	58.21	14.37
11.0	39.20	11.28	11.1	42.45	61.99	11.1	13.89	58.24	11.1	14.66	13.12	11.1	58.11	14.06
12.0	39.27	10.90	12.1	42.30	61.81	12.1	13.87	57.90	12.1	14.59	12.94	12.1	58.02	13.74
13.0	39.44	10.53	13.1	42.13	61.60	13.1	13.85	57.56	13.1	14.51	12.78	13.1	57.95	13.41
14.0	39.65	10.18	14.1	41.96	61.36	14.1	13.84	57.22	14.1	14.42	12.56	14.1	57.90	13.12
15.0	39.89	9.85	15.1	41.79	61.10	15.1	13.83	56.91	15.1	14.34	12.33	15.1	57.84	12.81
16.0	40.09	9.53	16.1	41.63	60.82	16.1	13.83	56.62	16.1	14.25	12.05	16.1	57.80	12.53
17.0	40.22	9.24	17.1	41.49	60.53	17.1	13.81	56.33	17.1	14.16	11.78	17.1	57.74	12.28
18.0	40.29	8.94	18.1	41.35	60.21	18.1	13.78	56.06	18.1	14.09	11.50	18.1	57.66	12.04
19.0	40.30	8.62	19.1	41.25	59.92	19.1	13.75	55.75	19.1	14.03	11.23	19.1	57.58	11.77
20.0	40.28	8.29	20.1	41.16	59.63	20.1	13.71	55.44	20.1	13.99	10.93	20.1	57.48	11.51
21.0	40.27	7.93	21.1	41.08	59.35	21.1	13.64	55.11	21.1	13.93	10.66	21.1	57.38	11.21
22.0	40.30	7.56	22.0	41.01	59.11	22.1	13.61	54.78	22.1	13.89	10.41	22.1	57.28	10.89
23.0	40.40	7.19	23.0	40.96	58.86	23.1	13.58	54.41	23.1	13.84	10.17	23.1	57.19	10.57
24.0	40.58	6.79	24.0	40.87	58.64	24.1	13.56	54.05	24.1	13.80	9.94	24.1	57.12	10.24
25.0	40.83	6.41	25.0	40.78	58.36	25.1	13.55	53.72	25.1	13.75	9.69	25.1	57.06	9.90
25.9	41.14	6.06	26.0	40.68	58.12	26.0	13.55	53.34	26.1	13.70	9.46	26.1	57.01	9.54
26.9	41.50	5.72	27.0	40.59	57.85	27.0	13.56	52.99	27.1	13.65	9.21	27.1	56.96	9.21
27.9	41.89	5.37	28.0	40.49	57.56	28.0	13.56	52.68	28.1	13.60	8.94	28.1	56.93	8.89
28.9	42.29	5.04	29.0	40.42	57.24	29.0	13.58	52.35	29.0	13.54	8.64	29.1	56.89	8.56
29.9	42.66	4.71	30.0	40.37	56.92	30.0	13.59	52.03	30.0	13.48	8.34	30.1	56.86	8.24
30.9	43.01	4.40	31.0	40.32	56.60	31.0	13.60	51.71	31.0	13.43	8.02	31.1	56.83	7.95
31.9	43.33	4.10	32.0	40.27	56.26	32.0	13.60	51.42	32.0	13.38	7.69	32.1	56.79	7.65
	51.44	+51.43		12.29	−12.25		6.93	+6.85		6.10	−6.02		8.19	+8.13
8^h 14^m $48^s.311$			9^h 9^m $6^s.085$			9^h 25^m $12^s.930$			9^h 36^m $24^s.003$			10^h 20^m $57^s.259$		
+88° 53′ 11″.43			−85° 19′ 42″.77			+81° 41′ 57″.18			−80° 33′ 50″.61			+82° 59′ 12″.27		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

η Octantis. Mag. 6.3			**Bradley 1672.** Mag. 6.3			**ι Octantis.** Mag. 5.4			**32 H. Camelop.** *seq.* Mag. 5.3			**κ Octantis.** Mag. 5.6		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
July	10 59	−84 8	July	12 14	+88 9	July	12 45	−84 40	July	12 48	+83 52	July	13 27	−85 21
	s	″		s	″		s	″		s	″		s	″
1.2	47.38	64.13	1.2	32.97	60.11	1.3	63.74	39.52	1.3	33.54	13.89	1.3	13.46	59.82
2.2	47.17	64.06	2.2	32.40	60.01	2.3	63.52	39.59	2.3	33.37	13.82	2.3	13.21	59.96
3.2	46.96	63.95	3.2	31.84	59.90	3.3	63.28	39.64	3.3	33.20	13.77	3.3	12.96	60.07
4.2	46.76	63.82	4.2	31.27	59.81	4.2	63.05	39.68	4.3	33.03	13.73	4.3	12.70	60.16
5.2	46.57	63.70	5.2	30.67	59.70	5.2	62.82	39.69	5.2	32.84	13.69	5.3	12.45	60.23
6.2	46.38	63.56	6.2	30.05	59.62	6.2	62.59	39.69	6.2	32.66	13.66	6.3	12.19	60.29
7.2	46.21	63.41	7.2	29.39	59.53	7.2	62.40	39.68	7.2	32.46	13.63	7.3	11.96	60.34
8.2	46.06	63.27	8.2	28.69	59.40	8.2	62.20	39.67	8.2	32.23	13.59	8.3	11.74	60.37
9.2	45.91	63.16	9.2	27.97	59.28	9.2	62.02	39.67	9.2	32.02	13.52	9.3	11.54	60.41
10.2	45.76	63.05	10.2	27.25	59.10	10.2	61.86	39.67	10.2	31.80	13.42	10.3	11.35	60.47
11.2	45.63	62.95	11.2	26.55	58.93	11.2	61.68	39.71	11.2	31.59	13.30	11.3	11.17	60.54
12.2	45.47	62.88	12.2	25.88	58.70	12.2	61.52	39.76	12.2	31.39	13.14	12.3	10.98	60.64
13.2	45.30	62.80	13.2	25.27	58.48	13.2	61.33	39.81	13.2	31.20	12.98	13.3	10.76	60.74
14.1	45.11	62.71	14.2	24.72	58.25	14.2	61.10	39.86	14.2	31.02	12.80	14.3	10.54	60.84
15.1	44.93	62.58	15.2	24.22	58.05	15.2	60.89	39.89	15.2	30.86	12.65	15.2	10.27	60.93
16.1	44.72	62.41	16.2	23.72	57.86	16.2	60.65	39.91	16.2	30.71	12.49	16.2	10.01	61.00
17.1	44.52	62.23	17.2	23.23	57.70	17.2	60.41	39.86	17.2	30.56	12.37	17.2	9.74	61.03
18.1	44.35	62.03	18.2	22.70	57.52	18.2	60.18	39.80	18.2	30.38	12.26	18.2	9.46	61.02
19.1	44.20	61.83	19.2	22.14	57.37	19.2	59.94	39.72	19.2	30.21	12.15	19.2	9.21	60.99
20.1	44.05	61.63	20.2	21.53	57.22	20.2	59.75	39.64	20.2	30.01	12.05	20.2	8.97	60.96
21.1	43.92	61.44	21.2	20.87	57.06	21.2	59.56	39.54	21.2	29.81	11.91	21.2	8.74	60.95
22.1	43.81	61.28	22.2	20.21	56.86	22.2	59.39	39.47	22.2	29.60	11.78	22.2	8.54	60.93
23.1	43.69	61.08	23.2	19.54	56.63	23.2	59.22	39.42	23.2	29.39	11.64	23.2	8.34	60.92
24.1	43.55	60.92	24.2	18.91	56.39	24.2	59.05	39.37	24.2	29.19	11.45	24.2	8.14	60.93
25.1	43.43	60.76	25.2	18.31	56.16	25.2	58.88	39.30	25.2	29.00	11.25	25.2	7.93	60.93
26.1	43.29	60.59	26.2	17.75	55.89	26.2	58.69	39.26	26.2	28.81	11.07	26.2	7.71	60.94
27.1	43.14	60.41	27.2	17.24	55.61	27.2	58.49	39.21	27.2	28.65	10.83	27.2	7.48	60.94
28.1	42.99	60.21	28.2	16.76	55.37	28.2	58.28	39.16	28.2	28.49	10.62	28.2	7.24	60.93
29.1	42.84	60.00	29.2	16.29	55.12	29.2	58.06	39.07	29.2	28.35	10.41	29.2	6.98	60.89
30.1	42.68	59.77	30.2	15.84	54.87	30.2	57.84	38.98	30.2	28.19	10.21	30.2	6.70	60.86
31.1	42.53	59.53	31.2	15.40	54.64	31.2	57.61	38.87	31.2	28.04	10.02	31.2	6.44	60.78
32.1	42.38	59.27	32.2	14.95	54.40	32.2	57.39	38.74	32.2	27.89	9.83	32.2	6.17	60.71
	9.81	−9.76		31.25	+31.23		10.78	−10.73		9.37	+9.31		12.38	−12.34
10h 59m 55s.642			12h 14m 28s.053			12h 46m 1s.183			12h 48m 29s.976			13h 27m 5s.514		
−84° 8′ 31″.24			+88° 9′ 56″.03			−84° 40′ 2″.72			+83° 52′ 10″.05			−85° 21′ 23″.59		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			Groombridge 2283. Mag. 7.2			ρ Octantis. Mag. 5.7			ε Ursæ Minoris. Mag. 4.4			59 G. Apodis. Mag. 5.9		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
July	14 13	−83 17	July	15 3	+87 33	July	15 23	−84 11	July	16 54	+82 10	July	17 15	−80 47
	s	″		s	″		s	″		s	″		s	″
1.3	28.85	38.30	1.4	68.65	26.65	1.4	61.24	46.13	1.4	36.30	38.80	1.4	60.37	16.56
2.3	28.71	38.49	2.4	68.22	26.76	2.4	61.12	46.38	2.4	36.22	39.03	2.4	60.36	16.87
3.3	28.55	38.65	3.3	67.79	26.87	3.4	60.99	46.63	3.4	36.13	39.27	3.4	60.33	17.18
4.3	28.39	38.81	4.3	67.37	26.99	4.4	60.85	46.85	4.4	36.05	39.52	4.4	60.30	17.48
5.3	28.23	38.93	5.3	66.95	27.12	5.4	60.70	47.06	5.4	35.96	39.78	5.4	60.26	17.77
6.3	28.07	39.04	6.3	66.50	27.26	6.4	60.55	47.24	6.4	35.86	40.05	6.4	60.22	18.02
7.3	27.92	39.13	7.3	66.02	27.41	7.4	60.40	47.42	7.4	35.77	40.32	7.4	60.18	18.27
8.3	27.77	39.23	8.3	65.51	27.55	8.3	60.27	47.59	8.4	35.67	40.63	8.4	60.15	18.50
9.3	27.65	39.31	9.3	64.98	27.71	9.3	60.15	47.76	9.4	35.55	40.93	9.4	60.13	18.72
10.3	27.54	39.43	10.3	64.40	27.82	10.3	60.05	47.93	10.4	35.43	41.21	10.4	60.11	18.95
11.3	27.43	39.56	11.3	63.82	27.92	11.3	59.95	48.12	11.4	35.31	41.48	11.4	60.10	19.18
12.3	27.31	39.69	12.3	63.25	27.99	12.3	59.85	48.33	12.4	35.18	41.73	12.4	60.10	19.43
13.3	27.18	39.85	13.3	62.69	28.02	13.3	59.75	48.54	13.4	35.04	41.94	13.4	60.09	19.70
14.3	27.04	40.00	14.3	62.16	28.04	14.3	59.63	48.77	14.4	34.91	42.14	14.4	60.08	20.00
15.3	26.89	40.15	15.3	61.66	28.06	15.3	59.49	48.99	15.4	34.79	42.31	15.4	60.05	20.31
16.3	26.72	40.27	16.3	61.18	28.07	16.3	59.32	49.20	16.4	34.67	42.48	16.4	60.01	20.61
17.3	26.55	40.36	17.3	60.71	28.11	17.3	59.15	49.40	17.4	34.55	42.67	17.4	59.96	20.89
18.3	26.36	40.42	18.3	60.25	28.18	18.3	58.97	49.56	18.4	34.44	42.86	18.4	59.89	21.15
19.3	26.19	40.49	19.3	59.77	28.24	19.3	58.79	49.70	19.4	34.32	43.09	19.4	59.81	21.39
20.3	26.03	40.52	20.3	59.24	28.32	20.3	58.62	49.82	20.4	34.20	43.33	20.4	59.74	21.61
21.3	25.87	40.53	21.3	58.69	28.40	21.3	58.46	49.92	21.4	34.06	43.59	21.4	59.68	21.79
22.3	25.74	40.55	22.3	58.12	28.49	22.3	58.32	50.01	22.4	33.93	43.84	22.4	59.63	21.98
23.3	25.60	40.58	23.3	57.52	28.54	23.3	58.17	50.12	23.4	33.78	44.07	23.4	59.57	22.15
24.3	25.48	40.61	24.3	56.92	28.57	24.3	58.04	50.24	24.4	33.63	44.29	24.4	59.53	22.34
25.3	25.34	40.65	25.3	56.34	28.59	25.3	57.90	50.38	25.4	33.48	44.48	25.4	59.49	22.56
26.2	25.19	40.72	26.3	55.76	28.58	26.3	57.76	50.51	26.4	33.33	44.66	26.4	59.44	22.79
27.2	25.04	40.78	27.3	55.20	28.56	27.3	57.60	50.64	27.4	33.18	44.82	27.4	59.39	23.03
28.2	24.88	40.84	28.3	54.67	28.53	28.3	57.43	50.78	28.4	33.03	44.96	28.4	59.34	23.27
29.2	24.71	40.88	29.3	54.15	28.50	29.3	57.25	50.93	29.4	32.88	45.09	29.4	59.27	23.52
30.2	24.53	40.91	30.3	53.64	28.46	30.3	57.06	51.06	30.4	32.74	45.23	30.4	59.19	23.76
31.2	24.34	40.91	31.3	53.15	28.45	31.3	56.86	51.17	31.3	32.60	45.37	31.4	59.10	24.01
32.2	24.15	40.90	32.3	52.65	28.44	32.3	56.66	51.24	32.3	32.47	45.52	32.4	59.01	24.22
8.56		−8.50	23.47		+23.45	9.89		−9.84	7.35		+7.28	6.25		−6.17
$14^{\rm h}$	$13^{\rm m}$	$18^{\rm s}.531$	$15^{\rm h}$	$4^{\rm m}$	$0^{\rm s}.607$	$15^{\rm h}$	$23^{\rm m}$	$43^{\rm s}.237$	$16^{\rm h}$	$54^{\rm m}$	$31^{\rm s}.741$	$17^{\rm h}$	$15^{\rm m}$	$43^{\rm s}.730$
−83°	17′	4″.27	+87°	33′	24″.43	−84°	11′	17″.84	+82°	10′	38″.40	−80°	47′	2″.69

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Ursæ Minoris. Mag. 4.4			**χ Octantis.** Mag. 5.2			**λ Ursæ Minoris.** Mag. 6.6			**σ Octantis.** Mag. 5.5			**76 Draconis.** Mag. 5.7		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
July	17 59	+86 36	July	18 6	−87 39	July	19 3	+89 0	July	19 29	−89 13	July	20 48	+82 13
	s	″		s	″		s	″		s	″		s	″
1.5	27.88	50.43	1.5	38.23	58.62	1.5	68.14	54.79	1.5	9.35	29.29	1.6	48.40	13.37
2.5	27.74	50.71	2.5	38.28	58.96	2.5	67.94	55.09	2.5	10.06	29.60	2.6	48.45	13.67
3.5	27.61	50.98	3.5	38.29	59.30	3.5	67.77	55.38	3.5	10.67	29.92	3.6	48.50	13.97
4.5	27.48	51.27	4.5	38.27	59.63	4.5	67.62	55.70	4.5	11.17	30.24	4.6	48.58	14.27
5.5	27.36	51.56	5.5	38.22	59.94	5.5	67.51	56.01	5.5	11.58	30.55	5.6	48.61	14.57
6.5	27.24	51.87	6.5	38.15	60.24	6.5	67.41	56.33	6.5	11.92	30.83	6.6	48.68	14.89
7.5	27.11	52.20	7.5	38.08	60.52	7.5	67.30	56.67	7.5	12.20	31.12	7.6	48.74	15.20
8.5	26.95	52.52	8.5	38.02	60.79	8.5	67.15	57.03	8.5	12.47	31.38	8.6	48.81	15.57
9.4	26.78	52.88	9.5	37.97	61.05	9.5	66.91	57.40	9.5	12.79	31.63	9.6	48.87	15.95
10.4	26.58	53.22	10.5	37.97	61.29	10.5	66.58	57.77	10.5	13.19	31.88	10.6	48.93	16.34
11.4	26.35	53.56	11.4	37.98	61.54	11.5	66.15	58.14	11.5	13.68	32.14	11.6	48.97	16.74
12.4	26.11	53.88	12.4	38.02	61.82	12.5	65.61	58.50	12.5	14.24	32.40	12.6	49.01	17.14
13.4	25.84	54.16	13.4	38.07	62.12	13.5	65.02	58.84	13.5	14.84	32.68	13.6	49.03	17.52
14.4	25.59	54.42	14.4	38.07	62.44	14.5	64.41	59.15	14.5	15.41	33.00	14.6	49.04	17.89
15.4	25.34	54.66	15.4	38.05	62.76	15.5	63.83	59.43	15.5	15.89	33.31	15.6	49.05	18.23
16.4	25.11	54.88	16.4	37.98	63.11	16.5	63.29	59.73	16.5	16.25	33.63	16.6	49.06	18.55
17.4	24.92	55.12	17.4	37.84	63.44	17.5	62.83	60.00	17.5	16.46	33.98	17.5	49.08	18.87
18.4	24.72	55.38	18.4	37.67	63.74	18.5	62.43	60.32	18.5	16.52	34.30	18.5	49.10	19.18
19.4	24.52	55.66	19.4	37.49	64.02	19.5	62.07	60.64	19.5	16.47	34.60	19.5	49.13	19.52
20.4	24.30	55.95	20.4	37.29	64.29	20.5	61.68	60.98	20.5	16.39	34.89	20.5	49.17	19.88
21.4	24.08	56.27	21.4	37.11	64.53	21.5	61.26	61.32	21.5	16.29	35.17	21.5	49.20	20.26
22.4	23.85	56.59	22.4	36.95	64.76	22.5	60.76	61.67	22.5	16.22	35.43	22.5	49.23	20.65
23.4	23.57	56.89	23.4	36.80	65.00	23.5	60.19	62.01	23.5	16.23	35.68	23.5	49.25	21.05
24.4	23.30	57.18	24.4	36.67	65.24	24.5	59.52	62.35	24.5	16.28	35.94	24.5	49.26	21.45
25.4	22.99	57.45	25.4	36.55	65.49	25.5	58.80	62.68	25.5	16.37	36.21	25.5	49.26	21.85
26.4	22.68	57.70	26.4	36.42	65.76	26.4	58.05	63.00	26.5	16.47	36.49	26.5	49.26	22.22
27.4	22.39	57.95	27.4	36.28	66.05	27.4	57.26	63.30	27.5	16.54	36.79	27.5	49.25	22.60
28.4	22.09	58.18	28.4	36.12	66.33	28.4	56.46	63.60	28.5	16.57	37.10	28.5	49.23	22.96
29.4	21.80	58.40	29.4	35.93	66.62	29.4	55.69	63.88	29.5	16.55	37.44	29.5	49.22	23.29
30.4	21.51	58.60	30.4	35.71	66.92	30.4	54.94	64.16	30.5	16.41	37.76	30.5	49.20	23.63
31.4	21.23	58.80	31.4	35.44	67.22	31.4	54.23	64.42	31.5	16.16	38.09	31.5	49.18	23.96
32.4	20.96	59.02	32.4	35.15	67.51	32.4	53.55	64.69	32.4	15.83	38.41	32.5	49.16	24.29
	16.94	+16.91		24.57	−24.55		58.26	+58.25		74.02	−74.01		7.39	+7.32
$17^h\ 59^m\ 20^s.805$			$18^h\ 5^m\ 36^s.163$			$19^h\ 3^m\ 51^s.560$			$19^h\ 26^m\ 7^s.189$			$20^h\ 48^m\ 44^s.660$		
+86° 36′ 51″.19			−87° 39′ 52″.21			+89° 0′ 56″.70			−89° 13′ 35″.99			+82° 13′ 16″.38		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			υ Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ^1 Octantis. Mag. 5.1		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
July	21 38	−83 5	July	22 16	−86 23	July	22 37	−81 48	July	23 27	+86 50	July	23 47	−82 28
	s	″		s	″		s	″		s	″		s	″
1.6	27.49	57.97	1.7	22.65	15.75	1.7	44.35	49.73	1.7	46.62	35.07	1.7	20.06	32.62
2.6	27.65	58.15	2.6	22.99	15.89	2.7	44.50	49.81	2.7	46.93	35.25	2.7	20.24	32.61
3.6	27.81	58.33	3.6	23.32	16.04	3.7	44.67	49.92	3.7	47.24	35.40	3.7	20.43	32.62
4.6	27.97	58.53	4.6	23.63	16.20	4.7	44.81	50.06	4.7	47.55	35.56	4.7	20.60	32.65
5.6	28.11	58.73	5.6	23.91	16.37	5.7	44.96	50.19	5.7	47.88	35.72	5.7	20.77	32.69
6.6	28.23	58.93	6.6	24.18	16.53	6.7	45.09	50.32	6.7	48.23	35.89	6.7	20.92	32.73
7.6	28.34	59.12	7.6	24.43	16.70	7.7	45.20	50.46	7.7	48.60	36.07	7.7	21.07	32.78
8.6	28.45	59.31	8.6	24.67	16.85	8.6	45.31	50.57	8.7	48.98	36.26	8.7	21.21	32.82
9.6	28.57	59.46	9.6	24.90	16.99	9.6	45.42	50.67	9.7	49.38	36.48	9.7	21.35	32.85
10.6	28.69	59.62	10.6	25.15	17.11	10.6	45.55	50.75	10.7	49.76	36.73	10.7	21.50	32.87
11.6	28.83	59.76	11.6	25.41	17.22	11.6	45.69	50.84	11.7	50.13	37.00	11.7	21.64	32.88
12.6	28.97	59.90	12.6	25.70	17.34	12.6	45.83	50.91	12.7	50.48	37.28	12.7	21.80	32.87
13.6	29.12	60.04	13.6	26.02	17.47	13.6	45.98	51.01	13.7	50.78	37.57	13.7	21.99	32.88
14.6	29.28	60.23	14.6	26.34	17.61	14.6	46.13	51.13	14.7	51.06	37.85	14.7	22.17	32.90
15.6	29.44	60.45	15.6	26.66	17.79	15.6	46.29	51.27	15.7	51.30	38.11	15.7	22.35	32.94
16.6	29.58	60.69	16.6	26.97	17.98	16.6	46.44	51.43	16.7	51.55	38.36	16.7	22.54	33.01
17.6	29.72	60.93	17.6	27.25	18.21	17.6	46.58	51.60	17.7	51.82	38.58	17.7	22.71	33.10
18.6	29.83	61.20	18.6	27.49	18.43	18.6	46.70	51.79	18.7	52.10	38.80	18.7	22.86	33.21
19.6	29.92	61.44	19.6	27.70	18.67	19.6	46.80	51.99	19.7	52.40	39.03	19.7	23.01	33.34
20.6	30.00	61.68	20.6	27.90	18.90	20.6	46.90	52.18	20.6	52.72	39.27	20.7	23.14	33.47
21.6	30.07	61.92	21.6	28.07	19.10	21.6	46.99	52.36	21.6	53.06	39.52	21.7	23.26	33.58
22.6	30.15	62.11	22.6	28.25	19.30	22.6	47.09	52.53	22.6	53.40	39.78	22.7	23.39	33.69
23.6	30.24	62.31	23.6	28.45	19.49	23.6	47.18	52.69	23.6	53.73	40.07	23.7	23.52	33.78
24.6	30.33	62.52	24.6	28.65	19.67	24.6	47.29	52.83	24.6	54.04	40.39	24.7	23.66	33.87
25.6	30.43	62.73	25.6	28.87	19.86	25.6	47.40	52.99	25.6	54.33	40.70	25.7	23.80	33.96
26.6	30.54	62.95	26.6	29.09	20.05	26.6	47.52	53.15	26.6	54.59	41.02	26.6	23.95	34.06
27.6	30.65	63.17	27.6	29.33	20.26	27.6	47.64	53.33	27.6	54.84	41.34	27.6	24.10	34.17
28.6	30.75	63.42	28.6	29.58	20.48	28.6	47.76	53.53	28.6	55.06	41.64	28.6	24.26	34.29
29.6	30.86	63.70	29.6	29.81	20.72	29.6	47.88	53.75	29.6	55.26	41.94	29.6	24.42	34.42
30.5	30.95	63.98	30.6	30.03	20.99	30.6	47.99	53.98	30.6	55.46	42.24	30.6	24.58	34.57
31.5	31.04	64.28	31.6	30.23	21.27	31.6	48.10	54.22	31.6	55.68	42.52	31.6	24.72	34.75
32.5	31.10	64.58	32.6	30.41	21.54	32.6	48.19	54.48	32.6	55.91	42.78	32.6	24.87	34.92
8.32		−8.26	15.87		−15.84	7.02		−6.95	18.16		+18.14	7.64		−7.57
21^h	38^m	$10^s.025$	22^h	15^m	$56^s.333$	22^h	37^m	$32^s.703$	23^h	27^m	$44^s.392$	23^h	47^m	$12^s.813$
−83°	6′	23″.31	−86°	23′	45″.22	−81°	49′	21″.11	+86°	50′	39″.03	−82°	29′	8″.43

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. **Mag. 4.5**			*α* **Ursæ Minoris.** (*Polaris.*) Mag. 2.1			**4 G. Octantis.** Mag. 5.6			**Groombridge 750.** Mag. 6.7			**Groombridge 944.** **Mag. 6.4**		
Wash. Mean Time.	**Right Ascension.**	**Declination.**	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Aug.	0 57	+85 48	Aug.	1 30	+88 51	Aug.	1 42	−85 11	Aug.	4 9	+85 19	Aug.	5 34	+85 9
	s	″		s	″		s	″		s	″		s	″
0.7	11.49	26.57	0.7	12.68	24.30	0.7	8.81	1.48	0.8	52.10	56.00	0.9	59.14	21.43
1.7	11.74	26.76	1.7	13.64	24.44	1.7	9.07	1.53	1.8	52.37	55.92	1.9	59.35	21.26
2.7	11.99	26.94	2.7	14.64	24.58	2.7	9.32	1.60	2.8	52.63	55.84	2.9	59.55	21.07
3.7	12.26	27.12	3.7	15.72	24.73	3.7	9.56	1.68	3.8	52.90	55.76	3.9	59.77	20.86
4.7	12.54	27.31	4.7	16.85	24.88	4.7	9.79	1.76	4.8	53.20	55.65	4.9	60.00	20.64
5.7	12.86	27.52	5.7	18.02	25.05	5.7	9.99	1.82	5.8	53.52	55.56	5.9	60.25	20.42
6.7	13.17	27.76	6.7	19.23	25.22	6.7	10.19	1.88	6.8	53.84	55.49	6.9	60.53	20.20
7.7	13.46	28.03	7.7	20.42	25.44	7.7	10.41	1.95	7.8	54.19	55.45	7.9	60.82	20.00
8.7	13.76	28.33	8.7	21.58	25.67	8.7	10.63	1.96	8.8	54.53	55.40	8.9	61.14	19.81
9.7	14.04	28.62	9.7	22.68	25.93	9.7	10.85	1.98	9.8	54.89	55.40	9.9	61.44	19.68
10.7	14.29	28.93	10.7	23.68	26.20	10.7	11.09	2.02	10.8	55.23	55.42	10.8	61.74	19.56
11.6	14.51	29.24	11.7	24.59	26.45	11.7	11.36	2.05	11.8	55.55	55.46	11.8	62.05	19.46
12.6	14.72	29.52	12.7	25.45	26.69	12.7	11.62	2.11	12.8	55.84	55.49	12.8	62.32	19.36
13.6	14.92	29.78	13.7	26.29	26.93	13.7	11.83	2.19	13.8	56.12	55.51	13.8	62.58	19.25
14.6	15.12	30.03	14.7	27.15	27.14	14.7	12.14	2.28	14.8	56.39	55.50	14.8	62.81	19.13
15.6	15.35	30.27	15.7	28.06	27.33	15.7	12.38	2.42	15.8	56.67	55.49	15.8	63.06	18.99
16.6	15.59	30.51	16.7	29.04	27.52	16.7	12.61	2.58	16.8	56.96	55.45	16.8	63.30	18.82
17.6	15.85	30.76	17.7	30.09	27.73	17.7	12.80	2.74	17.8	57.27	55.40	17.8	63.57	18.65
18.6	16.12	31.04	18.7	31.17	27.96	18.7	12.99	2.88	18.8	57.59	55.37	18.8	63.85	18.47
19.6	16.39	31.32	19.6	32.26	28.20	19.7	13.18	3.03	19.8	57.93	55.35	19.8	64.14	18.32
20.6	16.64	31.62	20.6	33.35	28.46	20.7	13.37	3.16	20.8	58.26	55.36	20.8	64.46	18.18
21.6	16.89	31.95	21.6	34.38	28.74	21.7	13.57	3.28	21.8	58.62	55.40	21.8	64.78	18.07
22.6	17.13	32.28	22.6	35.33	29.02	22.7	13.77	3.41	22.8	58.96	55.44	22.8	65.10	17.96
23.6	17.35	32.60	23.6	36.24	29.32	23.7	13.99	3.53	23.8	59.29	55.49	23.8	65.42	17.89
24.6	17.54	32.93	24.6	37.08	29.62	24.6	14.22	3.66	24.8	59.61	55.57	24.8	65.73	17.81
25.6	17.72	33.26	25.6	37.87	29.92	25.6	14.44	3.79	25.7	59.93	55.64	25.8	66.02	17.76
26.6	17.89	33.58	26.6	38.61	30.20	26.6	14.68	3.93	26.7	60.22	55.72	26.8	66.31	17.71
27.6	18.06	33.88	27.6	39.36	30.46	27.6	14.91	4.12	27.7	60.50	55.79	27.8	66.58	17.66
28.6	18.22	34.18	28.6	40.09	30.73	28.6	15.13	4.30	28.7	60.78	55.87	28.8	66.85	17.60
29.6	18.40	34.48	29.6	40.85	30.98	29.6	15.34	4.50	29.7	61.05	55.92	29.8	67.12	17.53
30.6	18.58	34.77	30.6	41.66	31.23	30.6	15.53	4.74	30.7	61.34	55.96	30.8	67.38	17.45
31.6	18.78	35.06	31.6	42.52	31.48	31.6	15.71	4.96	31.7	61.63	56.00	31.8	67.66	17.35
	13.68	+13.65		50.16	+50.15		11.91	−11.87		12.29	+12.25		11.84	+11.80
$0^h\ 57^m\ 1^s.657$			$1^h\ 29^m\ 44^s.254$			$1^h\ 42^m\ 6^s.102$			$4^h\ 9^m\ 44^s.952$			$5^h\ 34^m\ 54^s.014$		
+85° 48′ 25″.87			+88° 51′ 25″.03			−85° 11′ 39″.58			+85° 20′ 1″.04			+85° 9′ 28″.07		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Mensæ. Mag. 6.2			ζ Mensæ. Mag. 5.6			51 H. Cephei. Mag. 5.3			25 H. Camelop. Mag. 5.1			7 G. Octantis. Mag. 6.4		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Aug.	5 46	−84 49	Aug.	6 46	−80 43	Aug.	7 1	+87 10	Aug.	7 13	+82 34	Aug.	7 15	−86 53
	s	″		s	″		s	″		s	″		s	″
0.9	4.84	29.51	0.9	51.21	24.47	0.9	37.82	52.62	0.9	32.07	29.45	0.9	57.16	55.70
1.9	5.01	29.25	1.9	51.27	24.15	1.9	38.07	52.34	1.9	32.16	29.19	1.9	57.29	55.37
2.9	5.18	29.00	2.9	51.34	23.86	2.9	38.30	52.06	2.9	32.24	28.92	2.9	57.43	55.05
3.9	5.34	28.77	3.9	51.40	23.57	3.9	38.53	51.77	3.9	32.32	28.64	3.9	57.58	54.77
4.9	5.50	28.58	4.9	51.47	23.32	4.9	38.80	51.45	4.9	32.41	28.33	4.9	57.73	54.50
5.9	5.65	28.39	5.9	51.54	23.08	5.9	39.07	51.12	5.9	32.51	28.00	5.9	57.88	54.26
6.9	5.79	28.19	6.9	51.60	22.86	6.9	39.40	50.80	6.9	32.64	27.67	6.9	58.01	54.02
7.9	5.93	28.01	7.9	51.67	22.62	7.9	39.76	50.48	7.9	32.78	27.34	7.9	58.12	53.78
8.9	6.06	27.78	8.9	51.72	22.35	8.9	40.16	50.18	8.9	32.92	27.05	8.9	58.22	53.50
9.9	6.19	27.55	9.9	51.77	22.08	9.9	40.57	49.90	9.9	33.09	26.76	9.9	58.30	53.24
10.9	6.33	27.31	10.9	51.83	21.78	10.9	40.99	49.66	10.9	33.26	26.51	10.9	58.39	52.95
11.9	6.47	27.05	11.9	51.89	21.47	11.9	41.39	49.43	11.9	33.41	26.26	11.9	58.51	52.63
12.8	6.65	26.77	12.9	51.97	21.16	12.9	41.77	49.21	12.9	33.55	26.05	12.9	58.65	52.31
13.8	6.84	26.54	13.9	52.04	20.85	13.9	42.11	48.99	13.9	33.68	25.83	13.9	58.82	51.99
14.8	7.05	26.33	14.9	52.13	20.57	14.9	42.44	48.76	14.9	33.80	25.60	14.9	59.02	51.68
15.8	7.24	26.14	15.9	52.22	20.33	15.9	42.75	48.52	15.9	33.92	25.35	15.9	59.25	51.42
16.8	7.44	25.97	16.9	52.32	20.09	16.9	43.06	48.24	16.9	34.01	25.09	16.9	59.49	51.17
17.8	7.64	25.82	17.9	52.41	19.89	17.9	43.38	47.97	17.9	34.15	24.80	17.9	59.73	50.94
18.8	7.84	25.68	18.9	52.50	19.69	18.9	43.74	47.69	18.9	34.27	24.51	18.9	59.96	50.72
19.8	8.02	25.56	19.9	52.59	19.49	19.9	44.14	47.38	19.9	34.41	24.21	19.9	60.18	50.52
20.8	8.20	25.42	20.9	52.67	19.30	20.9	44.55	47.10	20.9	34.57	23.91	20.9	60.38	50.33
21.8	8.37	25.27	21.9	52.77	19.10	21.9	44.98	46.86	21.9	34.74	23.66	21.9	60.58	50.09
22.8	8.55	25.11	22.9	52.85	18.87	22.9	45.44	46.62	22.9	34.91	23.41	22.9	60.77	49.86
23.8	8.74	24.94	23.9	52.93	18.64	23.9	45.89	46.39	23.9	35.09	23.18	23.9	60.97	49.61
24.8	8.93	24.76	24.9	53.03	18.39	24.9	46.34	46.19	24.9	35.26	22.98	24.9	61.19	49.34
25.8	9.12	24.59	25.9	53.12	18.16	25.9	46.77	46.00	25.9	35.43	22.79	25.9	61.42	49.07
26.8	9.35	24.41	26.9	53.22	17.92	26.9	47.19	45.82	26.9	35.58	22.60	26.9	61.67	48.79
27.8	9.57	24.23	27.8	53.32	17.67	27.9	47.61	45.64	27.9	35.73	22.40	27.9	61.91	48.55
28.8	9.80	24.08	28.8	53.43	17.43	28.9	47.99	45.44	28.9	35.88	22.20	28.9	62.20	48.30
29.8	10.03	23.95	29.8	53.56	17.24	29.9	48.38	45.26	29.9	36.02	22.00	29.9	62.52	48.05
30.8	10.27	23.84	30.8	53.68	17.03	30.9	48.74	45.07	30.9	36.16	21.78	30.9	62.84	47.81
31.8	10.51	23.76	31.8	53.79	16.88	31.9	49.13	44.84	31.9	36.30	21.55	31.9	63.16	47.63
	11.08	−11.04		6.20	−6.12		20.33	+20.30		7.74	+7.67		18.48	−18.45
5^h	46^m	$26^s.439$	6^h	47^m	$3^s.489$	7^h	1^m	$34^s.861$	7^h	13^m	$29^s.477$	7^h	16^m	$40^s.555$
−84°	49′	48″.17	−80°	43′	34″.16	+87°	11′	0″.11	+82°	34′	36″.50	−86°	54′	0″.14

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			**ζ Octantis.** Mag. 5.4			**1 H. Draconis.** Mag. 4.6			**ζ Chamæleontis.** Mag. 5.2			**30 H. Camelop.** Mag. 5.3		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Aug.	8 14	+88 52	Aug.	9 8	−85 19	Aug.	9 25	+81 41	Aug.	9 36	−80 33	Aug.	10 20	+82 58
	s	″		s	″		s	″		s	″		s	″
0.9	43.33	64.10	1.0	40.27	56.26	1.0	13.60	51.42	1.0	13.38	67.69	1.1	56.79	67.65
1.9	43.61	63.78	2.0	40.22	55.94	2.0	13.60	51.11	2.0	13.34	67.36	2.1	56.74	67.36
2.9	43.86	63.46	3.0	40.14	55.61	3.0	13.59	50.79	3.0	13.32	67.04	3.1	56.69	67.05
3.9	44.10	63.13	4.0	40.07	55.32	4.0	13.58	50.47	4.0	13.30	66.74	4.1	56.63	66.75
4.9	44.35	62.78	5.0	40.05	55.02	5.0	13.56	50.13	5.0	13.29	66.44	5.1	56.57	66.41
5.9	44.67	62.41	6.0	40.04	54.74	6.0	13.55	49.76	6.0	13.27	66.15	6.1	56.50	66.05
6.9	45.08	62.04	7.0	40.04	54.50	7.0	13.56	49.38	7.0	13.26	65.92	7.1	56.45	65.67
7.9	45.58	61.63	8.0	40.02	54.23	8.0	13.59	48.97	8.0	13.24	65.67	8.1	56.44	65.26
8.9	46.19	61.25	8.9	39.98	53.97	9.0	13.63	48.58	9.0	13.23	65.42	9.0	56.42	64.87
9.9	46.87	60.90	9.9	39.93	53.70	10.0	13.69	48.20	10.0	13.20	65.14	10.0	56.42	64.49
10.9	47.58	60.57	10.9	39.88	53.39	11.0	13.74	47.84	11.0	13.16	64.85	11.0	56.43	64.11
11.9	48.28	60.25	11.9	39.83	53.08	12.0	13.80	47.50	12.0	13.13	64.54	12.0	56.45	63.76
12.9	48.92	59.96	12.9	39.79	52.74	12.9	13.86	47.19	13.0	13.11	64.23	13.0	56.47	63.42
13.9	49.51	59.67	13.9	39.78	52.42	13.9	13.88	46.88	14.0	13.09	63.88	14.0	56.47	63.10
14.9	50.02	59.38	14.9	39.79	52.06	14.9	13.91	46.57	15.0	13.07	63.54	15.0	56.46	62.78
15.9	50.48	59.06	15.9	39.82	51.73	15.9	13.92	46.25	15.9	13.07	63.21	16.0	56.43	62.47
16.9	50.94	58.75	16.9	39.86	51.41	16.9	13.94	45.91	16.9	13.07	62.89	17.0	56.40	62.13
17.9	51.43	58.40	17.9	39.91	51.12	17.9	13.95	45.54	17.9	13.09	62.60	18.0	56.37	61.77
18.9	51.97	58.03	18.9	39.97	50.85	18.9	13.99	45.15	18.9	13.11	62.30	19.0	56.35	61.38
19.9	52.57	57.68	19.9	40.02	50.57	19.9	14.02	44.77	19.9	13.13	62.02	20.0	56.34	61.01
20.9	53.26	57.33	20.9	40.07	50.30	20.9	14.07	44.38	20.9	13.15	61.74	21.0	56.34	60.61
21.9	54.01	56.99	21.9	40.11	50.05	21.9	14.12	44.00	21.9	13.16	61.46	22.0	56.34	60.22
22.9	54.82	56.66	22.9	40.13	49.77	22.9	14.20	43.62	22.9	13.17	61.19	23.0	56.37	59.83
23.9	55.65	56.35	23.9	40.16	49.48	23.9	14.28	43.28	23.9	13.17	60.89	24.0	56.41	59.45
24.9	56.49	56.06	24.9	40.19	49.18	24.9	14.36	42.93	24.9	13.17	60.58	25.0	56.46	59.08
25.9	57.33	55.78	25.9	40.22	48.86	25.9	14.44	42.61	25.9	13.18	60.26	26.0	56.50	58.73
26.9	58.13	55.52	26.9	40.26	48.52	26.9	14.49	42.30	26.9	13.18	59.94	26.9	56.53	58.39
27.9	58.90	55.24	27.9	40.32	48.19	27.9	14.56	41.99	27.9	13.20	59.61	27.9	56.56	58.05
28.9	59.63	54.97	28.9	40.40	47.85	28.9	14.62	41.67	28.9	13.23	59.26	28.9	56.58	57.72
29.9	60.33	54.70	29.9	40.49	47.53	29.9	14.66	41.34	29.9	13.26	58.92	29.9	56.60	57.39
30.9	60.99	54.40	30.9	40.59	47.24	30.9	14.71	41.02	30.9	13.30	58.58	30.9	56.61	57.05
31.9	61.68	54.09	31.9	40.72	46.94	31.9	14.76	40.69	31.9	13.34	58.29	31.9	56.61	56.68
	51.30	+51.29		12.29	−12.24		6.92	+6.85		6.10	−6.02		8.19	+8.13
8^h	14^m	$48^s.311$	9^h	9^m	$6^s.085$	9^h	25^m	$12^s.930$	9^h	36^m	$24^s.003$	10^h	20^m	$57^s.259$
+88°	53′	11″.43	−85°	19′	42″.77	+81°	41′	57″.18	−80°	33′	50″.61	+82°	59′	12″.27

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

η Octantis. Mag. 6.3			**Bradley 1672.** Mag. 6.3			**ι Octantis.** Mag. 5.4			**32 H. Camelop.** *seq.* Mag. 5.3			**κ Octantis.** Mag. 5.6		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Aug.	10 59	−84 8	Aug.	12 14	+88 9	Aug.	12 45	−84 40	Aug.	12 48	+83 52	Aug.	13 26	−85 21
	s	″		s	″		s	″		s	″		s	″
1.1	42.38	59.27	1.2	14.95	54.40	1.2	57.39	38.74	1.2	27.89	9.83	1.2	66.17	60.71
2.1	42.25	59.01	2.1	14.48	54.17	2.2	57.19	38.59	2.2	27.73	9.66	2.2	65.91	60.62
3.1	42.14	58.73	3.1	13.96	53.96	3.2	56.99	38.42	3.2	27.56	9.48	3.2	65.67	60.51
4.1	42.03	58.48	4.1	13.39	53.74	4.2	56.80	38.24	4.2	27.37	9.32	4.2	65.43	60.39
5.1	41.95	58.23	5.1	12.84	53.48	5.2	56.64	38.08	5.2	27.19	9.12	5.2	65.23	60.29
6.1	41.87	58.00	6.1	12.26	53.21	6.2	56.49	37.95	6.2	27.00	8.90	6.2	65.04	60.19
7.1	41.79	57.78	7.1	11.70	52.90	7.2	56.35	37.82	7.2	26.81	8.64	7.2	64.86	60.12
8.1	41.70	57.58	8.1	11.17	52.58	8.2	56.21	37.70	8.2	26.63	8.37	8.2	64.67	60.07
9.1	41.61	57.38	9.1	10.69	52.24	9.2	56.03	37.59	9.2	26.48	8.08	9.2	64.48	60.00
10.1	41.50	57.16	10.1	10.28	51.91	10.1	55.87	37.48	10.2	26.33	7.79	10.2	64.26	59.96
11.1	41.37	56.93	11.1	9.92	51.58	11.1	55.68	37.40	11.1	26.20	7.49	11.2	64.04	59.91
12.1	41.25	56.69	12.1	9.59	51.28	12.1	55.49	37.26	12.1	26.08	7.21	12.2	63.79	59.82
13.1	41.12	56.41	13.1	9.27	50.99	13.1	55.28	37.10	13.1	25.96	6.93	13.2	63.52	59.70
14.1	41.02	56.09	14.1	8.92	50.70	14.1	55.08	36.91	14.1	25.83	6.69	14.2	63.27	59.55
15.1	40.92	55.78	15.1	8.56	50.44	15.1	54.88	36.69	15.1	25.70	6.45	15.2	63.03	59.38
16.1	40.86	55.50	16.1	8.13	50.17	16.1	54.72	36.47	16.1	25.55	6.22	16.2	62.80	59.19
17.1	40.80	55.21	17.1	7.68	49.87	17.1	54.58	36.24	17.1	25.40	5.99	17.2	62.61	59.03
18.1	40.75	54.92	18.1	7.21	49.56	18.1	54.43	36.01	18.1	25.22	5.72	18.2	62.42	58.85
19.0	40.71	54.65	19.1	6.73	49.24	19.1	54.30	35.81	19.1	25.05	5.46	19.2	62.24	58.68
20.0	40.66	54.40	20.1	6.26	48.89	20.1	54.18	35.61	20.1	24.90	5.17	20.2	62.07	58.54
21.0	40.61	54.15	21.1	5.85	48.53	21.1	54.06	35.42	21.1	24.75	4.85	21.1	61.90	58.39
22.0	40.56	53.88	22.1	5.47	48.17	22.1	53.93	35.24	22.1	24.61	4.53	22.1	61.72	58.24
23.0	40.50	53.62	23.1	5.14	47.82	23.1	53.78	35.05	23.1	24.48	4.20	23.1	61.54	58.08
24.0	40.44	53.36	24.1	4.84	47.44	24.1	53.64	34.86	24.1	24.38	3.86	24.1	61.34	57.95
25.0	40.36	53.08	25.1	4.58	47.11	25.1	53.48	34.64	25.1	24.28	3.55	25.1	61.14	57.76
26.0	40.28	52.77	26.1	4.34	46.77	26.1	53.31	34.43	26.1	24.17	3.24	26.1	60.91	57.58
27.0	40.23	52.44	27.1	4.12	46.43	27.1	53.14	34.21	27.1	24.07	2.98	27.1	60.68	57.41
28.0	40.17	52.11	28.1	3.88	46.12	28.1	52.99	33.96	28.1	23.98	2.63	28.1	60.47	57.20
29.0	40.12	51.78	29.1	3.61	45.81	29.1	52.84	33.69	29.1	23.88	2.34	29.1	60.26	56.95
30.0	40.09	51.44	30.1	3.33	45.48	30.1	52.69	33.41	30.1	23.76	2.06	30.1	60.06	56.73
31.0	40.08	51.11	31.1	3.02	45.18	31.1	52.57	33.11	31.1	23.63	1.78	31.1	59.89	56.48
32.0	40.08	50.78	32.1	2.66	44.85	32.1	52.47	32.82	32.1	23.50	1.48	32.1	59.74	56.22
9.81		−9.76	31.21		+31.20	10.78		−10.73	9.36		+9.31	12.38		−12.34
10^h	59^m	$55^s.642$	12^h	14^m	$28^s.053$	12^h	46^m	$1^s.183$	12^h	48^m	$29^s.976$	13^h	27^m	$5^s.514$
−84°	8′	31″.24	+88°	9′	56″.03	−84°	40′	2″.72	+83°	52′	10″.05	−85°	21′	23″.59

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			Groombridge 2283. Mag. 7.2			ρ Octantis. Mag. 5.7			ε Ursæ Minoris. Mag. 4.4			59 G. Apodis. Mag. 5.9		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	°		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Aug.	14 13	−83 17	Aug.	15 3	+87 33	Aug.	15 23	−84 11	Aug.	16 54	+82 10	Aug.	17 15	−80 47
	s	″		s	″		s	″		s	″		s	″
1.2	24.15	40.90	1.3	52.65	28.44	1.3	56.66	51.24	1.3	32.47	45.52	1.4	59.01	24.22
2.2	23.97	40.86	2.3	52.15	28.43	2.3	56.45	51.31	2.3	32.33	45.68	2.4	58.91	24.43
3.2	23.79	40.83	3.3	51.62	28.45	3.3	56.25	51.36	3.3	32.19	45.85	3.4	58.81	24.60
4.2	23.62	40.76	4.3	51.08	28.45	4.3	56.06	51.40	4.3	32.04	46.02	4.4	58.71	24.76
5.2	23.47	40.70	5.3	50.50	28.46	5.3	55.89	51.42	5.3	31.88	46.20	5.3	58.63	24.90
6.2	23.33	40.64	6.3	49.88	28.45	6.3	55.73	51.45	6.3	31.71	46.38	6.3	58.55	25.03
7.2	23.20	40.59	7.3	49.25	28.42	7.3	55.58	51.48	7.3	31.54	46.54	7.3	58.48	25.15
8.2	23.07	40.57	8.2	48.63	28.35	8.3	55.42	51.54	8.3	31.36	46.68	8.3	58.42	25.32
9.2	22.94	40.56	9.2	48.02	28.25	9.3	55.28	51.62	9.3	31.18	46.79	9.3	58.36	25.50
10.2	22.80	40.56	10.2	47.45	28.13	10.3	55.12	51.71	10.3	31.01	46.88	10.3	58.30	25.69
11.2	22.64	40.56	11.2	46.91	28.01	11.3	54.94	51.79	11.3	30.84	46.94	11.3	58.22	25.90
12.2	22.47	40.54	12.2	46.37	27.90	12.3	54.76	51.87	12.3	30.68	47.00	12.3	58.14	26.11
13.2	22.28	40.50	13.2	45.88	27.80	13.2	54.54	51.93	13.3	30.52	47.06	13.3	58.03	26.30
14.2	22.09	40.42	14.2	45.38	27.69	14.2	54.32	51.95	14.3	30.36	47.13	14.3	57.91	26.48
15.2	21.91	40.31	15.2	44.88	27.63	15.2	54.11	51.96	15.3	30.20	47.21	15.3	57.79	26.63
16.2	21.75	40.19	16.2	44.37	27.56	16.2	53.90	51.92	16.3	30.05	47.32	16.3	57.67	26.75
17.2	21.59	40.07	17.2	43.80	27.50	17.2	53.70	51.88	17.3	29.88	47.45	17.3	57.56	26.86
18.2	21.45	39.93	18.2	43.22	27.42	18.2	53.51	51.83	18.3	29.70	47.57	18.3	57.46	26.94
19.2	21.31	39.80	19.2	42.62	27.35	19.2	53.34	51.79	19.3	29.53	47.69	19.3	57.36	27.02
20.2	21.18	39.69	20.2	42.01	27.26	20.2	53.18	51.75	20.3	29.35	47.81	20.3	57.26	27.10
21.2	21.06	39.59	21.2	41.42	27.12	21.2	53.02	51.73	21.3	29.15	47.88	21.3	57.18	27.19
22.2	20.93	39.49	22.2	40.84	27.00	22.2	52.85	51.71	22.3	28.97	47.93	22.3	57.08	27.30
23.2	20.79	39.39	23.2	40.27	26.83	23.2	52.68	51.70	23.3	28.78	47.96	23.3	57.00	27.43
24.2	20.64	39.29	24.2	39.73	26.67	24.2	52.50	51.69	24.3	28.61	47.98	24.3	56.90	27.54
25.2	20.48	39.18	25.2	39.21	26.51	25.2	52.30	51.68	25.3	28.43	47.99	25.3	56.79	27.66
26.2	20.31	39.06	26.2	38.72	26.33	26.2	52.10	51.66	26.3	28.26	48.00	26.3	56.67	27.79
27.2	20.14	38.94	27.2	38.24	26.16	27.2	51.90	51.63	27.3	28.09	48.01	27.3	56.55	27.91
28.2	19.97	38.77	28.2	37.77	26.00	28.2	51.68	51.57	28.3	27.92	48.01	28.3	56.42	28.02
29.2	19.81	38.60	29.2	37.29	25.85	29.2	51.46	51.49	29.3	27.75	48.03	29.3	56.28	28.09
30.2	19.65	38.40	30.2	36.80	25.71	30.2	51.25	51.39	30.3	27.58	48.06	30.3	56.15	28.16
31.2	19.50	38.19	31.2	36.29	25.59	31.2	51.04	51.27	31.3	27.41	48.11	31.3	56.01	28.19
32.1	19.36	37.98	32.2	35.74	25.47	32.2	50.85	51.14	32.3	27.24	48.15	32.3	55.88	28.21
	8.56	−8.50		23.47	+23.45		9.89	−9.84		7.35	+7.28		6.25	−6.17
14^{h}	13^{m}	$18^{s}.531$	15^{h}	4^{m}	$0^{s}.607$	15^{h}	23^{m}	$43^{s}.237$	16^{h}	54^{m}	$31^{s}.741$	17^{h}	15^{m}	$43^{s}.730$
−83°	17′	4″.27	+87°	33′	21″.43	−84°	11′	17″.84	+82°	10′	38″.40	−80°	47′	2″.69

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Ursæ Minoris. Mag. 4.4			χ Octantis. Mag. 5.2			λ Ursæ Minoris. Mag. 6.6			σ Octantis. Mag. 5.5			76 Draconis. Mag. 5.7		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Aug.	17 59	+86 36	Aug.	18 6	−87 40	Aug.	19 3	+89 1	Aug.	19 28	−89 13	Aug.	20 48	+82 13
	s	″		s	″		s	″		s	″		s	″
1.4	20.96	59.02	1.4	35.15	7.51	1.4	53.55	4.69	1.4	75.83	38.41	1.5	49.16	24.29
2.4	20.69	59.25	2.4	34.84	7.76	2.4	52.90	4.98	2.4	75.42	38.72	2.5	49.15	24.63
3.4	20.42	59.49	3.4	34.52	7.99	3.4	52.25	5.28	3.4	74.92	39.01	3.5	49.14	24.99
4.4	20.14	59.76	4.4	34.21	8.20	4.4	51.56	5.60	4.4	74.41	39.29	4.5	49.14	25.35
5.4	19.83	60.02	5.4	33.91	8.40	5.4	50.83	5.91	5.4	73.92	39.55	5.5	49.13	25.75
6.4	19.52	60.28	6.4	33.64	8.59	6.4	50.01	6.23	6.4	73.48	39.79	6.5	49.12	26.15
7.4	19.16	60.53	7.4	33.40	8.79	7.4	49.09	6.57	7.4	73.14	40.02	7.5	49.09	26.56
8.4	18.79	60.78	8.4	33.19	9.01	8.4	48.06	6.88	8.4	72.87	40.27	8.5	49.06	26.98
9.4	18.40	60.97	9.4	32.99	9.24	9.4	46.97	7.16	9.4	72.67	40.54	9.5	49.02	27.38
10.4	18.01	61.17	10.4	32.77	9.48	10.4	45.84	7.43	10.4	72.46	40.82	10.5	48.97	27.76
11.4	17.63	61.33	11.4	32.52	9.74	11.4	44.72	7.69	11.4	72.19	41.12	11.5	48.91	28.12
12.4	17.26	61.48	12.4	32.23	10.01	12.4	43.65	7.93	12.4	71.83	41.45	12.5	48.84	28.45
13.4	16.93	61.62	13.4	31.89	10.27	13.4	42.65	8.17	13.4	71.32	41.76	13.5	48.78	28.79
14.4	16.60	61.78	14.4	31.51	10.51	14.4	41.72	8.41	14.4	70.65	42.07	14.5	48.73	29.11
15.3	16.28	61.96	15.4	31.11	10.72	15.4	40.84	8.65	15.4	69.87	42.36	15.5	48.68	29.43
16.3	15.96	62.15	16.4	30.69	10.91	16.4	39.96	8.92	16.4	69.03	42.62	16.5	48.64	29.76
17.3	15.63	62.34	17.3	30.28	11.08	17.4	39.06	9.19	17.4	68.15	42.88	17.5	48.61	30.12
18.3	15.27	62.56	18.3	29.89	11.23	18.4	38.10	9.48	18.4	67.31	43.09	18.5	48.57	30.50
19.3	14.90	62.77	19.3	29.53	11.37	19.4	37.06	9.78	19.4	66.54	43.30	19.5	48.52	30.89
20.3	14.49	62.97	20.3	29.18	11.52	20.4	35.95	10.07	20.4	65.81	43.52	20.5	48.47	31.28
21.3	14.09	63.17	21.3	28.84	11.67	21.4	34.78	10.33	21.4	65.12	43.75	21.5	48.40	31.66
22.3	13.68	63.33	22.3	28.51	11.84	22.4	33.56	10.56	22.4	64.46	43.97	22.4	48.33	32.04
23.3	13.27	63.46	23.3	28.16	12.02	23.4	32.30	10.80	23.4	63.78	44.23	23.4	48.25	32.40
24.3	12.86	63.61	24.3	27.80	12.20	24.4	31.06	11.02	24.4	63.08	44.49	24.4	48.16	32.74
25.3	12.46	63.71	25.3	27.42	12.39	25.4	29.83	11.23	25.4	62.32	44.75	25.4	48.07	33.06
26.3	12.07	63.81	26.3	27.01	12.58	26.4	28.62	11.43	26.4	61.46	45.02	26.4	47.98	33.37
27.3	11.70	63.91	27.3	26.57	12.77	27.4	27.45	11.61	27.4	60.54	45.31	27.4	47.89	33.67
28.3	11.32	64.01	28.3	26.09	12.94	28.4	26.32	11.82	28.4	59.51	45.57	28.4	47.81	33.97
29.3	10.96	64.12	29.3	25.59	13.10	29.4	25.22	12.01	29.4	58.39	45.81	29.4	47.73	34.29
30.3	10.59	64.24	30.3	25.10	13.25	30.4	24.14	12.23	30.4	57.19	46.04	30.4	47.66	34.60
31.3	10.22	64.38	31.3	24.60	13.36	31.4	23.04	12.45	31.4	55.97	46.26	31.4	47.58	34.92
32.3	9.84	64.53	32.3	24.10	13.45	32.3	21.93	12.67	32.4	54.74	46.46	32.4	47.51	35.27
16.95		+16.92	24.59		−24.57	58.41		+58.40	74.26		−74.25	7.39		+7.32
17^h	59^m	20^s.805	18^h	5^m	36^s.163	19^h	3^m	51^s.560	19^h	26^m	7^s.189	20^h	48^m	44^s.660
+86°	36′	51″.19	−87°	39′	52″.21	+89°	0′	56″.70	−89°	13′	35″.99	+82°	13′	16″.38

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			**υ Octantis.** Mag. 5.7			**β Octantis.** Mag. 4.3			**39 H. Cephei.** Mag. 5.6			**γ¹ Octantis.** Mag. 5.1		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Aug.	21 38	−83 6	Aug.	22 16	−86 23	Aug.	22 37	−81 48	Aug.	23 27	+86 50	Aug.	23 47	−82 28
	s	″		s	″		s	″		s	″		s	″
1.5	31.10	4.58	1.6	30.41	21.54	1.6	48.19	54.48	1.6	55.91	42.78	1.6	24.87	34.92
2.5	31.15	4.88	2.6	30.56	21.82	2.6	48.28	54.74	2.6	56.13	43.06	2.6	24.99	35.12
3.5	31.20	5.16	3.6	30.69	22.10	3.6	48.35	55.00	3.6	56.38	43.33	3.6	25.10	35.32
4.5	31.24	5.45	4.6	30.80	22.37	4.6	48.40	55.25	4.6	56.65	43.63	4.6	25.20	35.53
5.5	31.27	5.69	5.6	30.90	22.61	5.6	48.47	55.49	5.6	56.92	43.95	5.6	25.31	35.72
6.5	31.31	5.93	6.6	31.01	22.84	6.6	48.53	55.70	6.6	57.20	44.29	6.6	25.40	35.89
7.5	31.35	6.16	7.6	31.14	23.06	7.6	48.60	55.90	7.6	57.45	44.65	7.6	25.52	36.04
8.5	31.42	6.37	8.5	31.28	23.28	8.6	48.69	56.09	8.6	57.68	45.03	8.6	25.64	36.19
9.5	31.49	6.60	9.5	31.46	23.50	9.6	48.79	56.28	9.6	57.88	45.41	9.6	25.77	36.33
10.5	31.56	6.85	10.5	31.64	23.73	10.6	48.88	56.49	10.6	58.05	45.80	10.6	25.90	36.47
11.5	31.64	7.13	11.5	31.82	24.01	11.6	48.98	56.72	11.6	58.18	46.17	11.6	26.04	36.65
12.5	31.71	7.42	12.5	31.99	24.28	12.6	49.08	56.98	12.6	58.31	46.52	12.6	26.19	36.84
13.5	31.77	7.74	13.5	32.14	24.60	13.6	49.16	57.26	13.6	58.44	46.85	13.6	26.32	37.06
14.5	31.80	8.06	14.5	32.26	24.91	14.5	49.22	57.55	14.6	58.58	47.17	14.6	26.43	37.29
15.5	31.81	8.38	15.5	32.34	25.22	15.5	49.27	57.85	15.6	58.74	47.48	15.6	26.53	37.54
16.5	31.82	8.68	16.5	32.39	25.54	16.5	49.32	58.14	16.6	58.92	47.80	16.6	26.61	37.80
17.5	31.81	8.98	17.5	32.43	25.83	17.5	49.35	58.42	17.6	59.12	48.14	17.6	26.69	38.05
18.5	31.80	9.26	18.5	32.46	26.09	18.5	49.38	58.68	18.6	59.33	48.49	18.6	26.76	38.30
19.5	31.80	9.51	19.5	32.50	26.35	19.5	49.41	58.92	19.6	59.54	48.85	19.6	26.83	38.53
20.5	31.80	9.76	20.5	32.54	26.61	20.5	49.45	59.17	20.6	59.72	49.24	20.6	26.91	38.74
21.5	31.81	10.02	21.5	32.60	26.87	21.5	49.49	59.41	21.6	59.88	49.64	21.6	26.99	38.96
22.5	31.83	10.29	22.5	32.67	27.13	22.5	49.53	59.66	22.6	60.01	50.03	22.6	27.09	39.18
23.5	31.85	10.55	23.5	32.75	27.39	23.5	49.59	59.92	23.6	60.12	50.42	23.6	27.18	39.40
24.5	31.87	10.84	24.5	32.83	27.67	24.5	49.64	60.19	24.6	60.21	50.80	24.6	27.27	39.63
25.5	31.89	11.15	25.5	32.90	27.98	25.5	49.69	60.47	25.6	60.28	51.17	25.6	27.37	39.86
26.5	31.90	11.46	26.5	32.97	28.30	26.5	49.74	60.77	26.5	60.34	51.53	26.6	27.47	40.13
27.5	31.90	11.78	27.5	33.01	28.62	27.5	49.78	61.09	27.5	60.41	51.90	27.6	27.57	40.41
28.5	31.88	12.11	28.5	33.03	28.95	28.5	49.80	61.42	28.5	60.48	52.25	28.6	27.65	40.70
29.5	31.85	12.43	29.5	33.05	29.29	29.5	49.82	61.75	29.5	60.56	52.58	29.6	27.71	41.00
30.5	31.81	12.76	30.5	33.02	29.62	30.5	49.83	62.07	30.5	60.65	52.92	30.6	27.76	41.31
31.5	31.75	13.06	31.5	32.97	29.93	31.5	49.82	62.39	31.5	60.76	53.26	31.6	27.81	41.62
32.5	31.69	13.34	32.5	32.92	30.23	32.5	49.81	62.69	32.5	60.89	53.63	32.5	27.85	41.92
	8.33	−8.27		15.88	−15.85		7.02	−6.95		18.18	+18.15		7.64	−7.57
21^{h} 38^{m} $10^{s}.025$			22^{h} 15^{m} $56^{s}.333$			22^{h} 37^{m} $32^{s}.703$			23^{h} 27^{m} $44^{s}.392$			23^{h} 47^{m} $12^{s}.813$		
−83° 6′ 23″.31			−86° 23′ 45″.22			−81° 49′ 21″.11			+86° 50′ 39″.03			−82° 29′ 8″.43		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			**α Ursæ Minoris.** (*Polaris.*) Mag. 2.1			**4 G. Octantis.** Mag. 5.6			**Groombridge 750.** Mag. 6.7			**Groombridge 944.** Mag. 6.4		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Sept.	0 57	+85 48	Sept.	1 30	+88 51	Sept.	1 42	−85 11	Sept.	4 10	+85 19	Sept.	5 35	+85 9
	s	″		s	″		s	″		s	″		s	″
0.6	18.78	35.06	0.6	42.52	31.48	0.6	15.71	4.96	0.7	1.63	56.00	0.8	7.66	17.35
1.6	18.98	35.36	1.6	43.44	31.75	1.6	15.87	5.21	1.7	1.95	56.03	1.8	7.94	17.24
2.6	19.21	35.68	2.6	44.38	32.03	2.6	16.02	5.40	2.7	2.28	56.07	2.8	8.27	17.14
3.6	19.44	36.02	3.6	45.33	32.35	3.6	16.16	5.61	3.7	2.63	56.13	3.8	8.59	17.03
4.6	19.65	36.40	4.6	46.25	32.68	4.6	16.31	5.79	4.7	2.99	56.22	4.8	8.94	16.97
5.6	19.84	36.78	5.6	47.11	33.03	5.6	16.49	5.96	5.7	3.35	56.35	5.8	9.30	16.93
6.6	20.01	37.18	6.6	47.87	33.39	6.6	16.66	6.12	6.7	3.69	56.48	6.8	9.65	16.92
7.6	20.15	37.58	7.6	48.55	33.75	7.6	16.84	6.30	7.7	4.03	56.63	7.8	9.99	16.92
8.6	20.28	37.96	8.6	49.16	34.09	8.6	17.04	6.49	8.7	4.32	56.79	8.8	10.30	16.94
9.6	20.38	38.32	9.6	49.71	34.43	9.6	17.24	6.71	9.7	4.61	56.94	9.8	10.60	16.96
10.6	20.49	38.65	10.6	50.26	34.76	10.6	17.43	6.95	10.7	4.87	57.09	10.8	10.88	16.96
11.6	20.62	38.98	11.6	50.85	35.06	11.6	17.59	7.23	11.7	5.14	57.21	11.8	11.15	16.95
12.6	20.76	39.29	12.6	51.50	35.35	12.6	17.74	7.50	12.7	5.42	57.31	12.8	11.43	16.94
13.6	20.91	39.60	13.6	52.23	35.64	13.6	17.88	7.80	13.7	5.71	57.40	13.8	11.71	16.90
14.6	21.09	39.93	14.6	52.99	35.95	14.6	17.98	8.08	14.7	6.03	57.48	14.8	12.02	16.84
15.6	21.26	40.29	15.6	53.78	36.27	15.6	18.09	8.34	15.7	6.34	57.58	15.8	12.34	16.79
16.6	21.43	40.66	16.6	54.55	36.60	16.6	18.20	8.62	16.7	6.67	57.72	16.7	12.67	16.77
17.5	21.58	41.05	17.6	55.28	36.96	17.6	18.30	8.85	17.7	7.01	57.85	17.7	13.01	16.76
18.5	21.72	41.45	18.6	55.95	37.35	18.6	18.42	9.09	18.7	7.34	58.03	18.7	13.35	16.76
19.5	21.83	41.84	19.6	56.54	37.71	19.6	18.55	9.35	19.7	7.66	58.21	19.7	13.69	16.79
20.5	21.93	42.23	20.6	57.08	38.09	20.6	18.68	9.59	20.7	7.95	58.40	20.7	14.03	16.84
21.5	22.02	42.62	21.6	57.55	38.48	21.6	18.81	9.83	21.7	8.25	58.59	21.7	14.35	16.91
22.5	22.10	43.01	22.6	57.96	38.85	22.6	18.95	10.09	22.7	8.53	58.79	22.7	14.64	16.98
23.5	22.15	43.38	23.6	58.35	39.20	23.6	19.09	10.37	23.7	8.78	58.99	23.7	14.93	17.05
24.5	22.20	43.73	24.6	58.74	39.55	24.6	19.21	10.66	24.7	9.03	59.18	24.7	15.22	17.11
25.5	22.26	44.08	25.5	59.14	39.88	25.6	19.32	10.97	25.7	9.29	59.35	25.7	15.49	17.18
26.5	22.35	44.42	26.5	59.58	40.19	26.6	19.42	11.30	26.7	9.54	59.50	26.7	15.77	17.23
27.5	22.42	44.77	27.5	60.04	40.52	27.6	19.51	11.63	27.7	9.81	59.66	27.7	16.05	17.26
28.5	22.52	45.11	28.5	60.58	40.84	28.6	19.57	11.96	28.7	10.08	59.82	28.7	16.34	17.27
29.5	22.64	45.48	29.5	61.14	41.21	29.6	19.61	12.29	29.7	10.37	59.97	29.7	16.66	17.28
30.5	22.75	45.86	30.5	61.72	41.58	30.5	19.66	12.59	30.6	10.68	60.15	30.7	16.97	17.32
31.5	22.85	46.26	31.5	62.27	41.97	31.5	19.69	12.88	31.6	11.00	60.35	31.7	17.32	17.37
13.69 +13.66			50.27 +50.26			11.91 −11.87			12.29 +12.25			11.84 +11.80		
0ʰ 57ᵐ 1ˢ.657			1ʰ 29ᵐ 44ˢ.254			1ʰ 42ᵐ 6ˢ.102			4ʰ 9ᵐ 44ˢ.952			5ʰ 34ᵐ 54ˢ.014		
+85° 48′ 25″.87			+88° 51′ 25″.03			−85° 11′ 39″.58			+85° 20′ 1″.04			+85° 9′ 28″.07		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Mensæ. Mag. 6.2			ζ Mensæ. Mag. 5.6			51 H. Cephei. Mag. 5.3			25 H. Camelop. Mag. 5.1			7 G. Octantis. Mag. 6.4		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Sept.	5 46	−84 49	Sept.	6 46	−80 43	Sept.	7 1	+87 10	Sept.	7 13	+82 34	Sept.	7 16	−86 53
	s	″		s	″		s	″		s	″		s	″
0.8	10.51	23.76	0.8	53.79	16.88	0.9	49.13	44.84	0.9	36.30	21.55	0.9	3.16	47.63
1.8	10.72	23.71	1.8	53.91	16.75	1.8	49.54	44.61	1.9	36.45	21.30	1.9	3.48	47.49
2.8	10.92	23.66	2.8	54.02	16.61	2.8	49.99	44.37	2.9	36.63	21.07	2.9	3.78	47.33
3.8	11.15	23.61	3.8	54.13	16.50	3.8	50.46	44.14	3.8	36.80	20.81	3.9	4.06	47.19
4.8	11.34	23.52	4.8	54.23	16.38	4.8	50.98	43.90	4.8	36.99	20.57	4.8	4.33	47.04
5.8	11.54	23.45	5.8	54.33	16.23	5.8	51.51	43.71	5.8	37.20	20.37	5.8	4.58	46.87
6.8	11.73	23.35	6.8	54.44	16.07	6.8	52.05	43.53	6.8	37.41	20.16	6.8	4.83	46.69
7.8	11.94	23.25	7.8	54.54	15.88	7.8	52.58	43.39	7.8	37.61	20.02	7.8	5.10	46.46
8.8	12.17	23.13	8.8	54.66	15.70	8.8	53.09	43.26	8.8	37.81	19.87	8.8	5.38	46.25
9.8	12.40	23.03	9.8	54.78	15.51	9.8	53.57	43.14	9.8	38.00	19.75	9.8	5.70	46.04
10.8	12.65	22.95	10.8	54.91	15.35	10.8	54.01	43.02	10.8	38.15	19.61	10.8	6.03	45.84
11.8	12.90	22.89	11.8	55.03	15.22	11.8	54.44	42.88	11.8	38.31	19.44	11.8	6.39	45.65
12.8	13.15	22.86	12.8	55.17	15.09	12.8	54.86	42.71	12.8	38.46	19.27	12.8	6.78	45.52
13.8	13.38	22.86	13.8	55.31	15.02	13.8	55.29	42.54	13.8	38.64	19.09	13.8	7.15	45.39
14.8	13.64	22.87	14.8	55.43	14.96	14.8	55.75	42.36	14.8	38.81	18.90	14.8	7.54	45.29
15.8	13.86	22.90	15.8	55.57	14.90	15.8	56.25	42.17	15.8	39.00	18.70	15.8	7.90	45.19
16.8	14.08	22.92	16.8	55.71	14.85	16.8	56.75	41.98	16.8	39.18	18.50	16.8	8.24	45.09
17.8	14.30	22.93	17.8	55.81	14.80	17.8	57.29	41.82	17.8	39.39	18.30	17.8	8.57	45.00
18.7	14.52	22.93	18.8	55.93	14.71	18.8	57.84	41.68	18.8	39.60	18.15	18.8	8.89	44.89
19.7	14.73	22.93	19.8	56.06	14.64	19.8	58.40	41.55	19.8	39.83	18.00	19.8	9.22	44.78
20.7	14.95	22.91	20.8	56.18	14.55	20.8	58.94	41.45	20.8	40.02	17.89	20.8	9.55	44.65
21.7	15.18	22.90	21.8	56.30	14.44	21.8	59.47	41.38	21.8	40.23	17.79	21.8	9.88	44.51
22.7	15.42	22.88	22.8	56.43	14.35	22.8	59.99	41.30	22.8	40.43	17.69	22.8	10.25	44.38
23.7	15.67	22.87	23.8	56.57	14.25	23.8	60.48	41.24	23.8	40.62	17.60	23.8	10.62	44.23
24.7	15.91	22.88	24.8	56.70	14.17	24.8	60.97	41.17	24.8	40.80	17.52	24.8	11.00	44.10
25.7	16.17	22.92	25.8	56.84	14.11	25.8	61.43	41.09	25.8	40.98	17.44	25.8	11.42	44.01
26.7	16.44	22.97	26.8	56.99	14.08	26.8	61.89	41.00	26.8	41.16	17.31	26.8	11.84	43.96
27.7	16.68	23.04	27.8	57.13	14.07	27.8	62.35	40.89	27.8	41.32	17.19	27.8	12.26	43.91
28.7	16.92	23.14	28.8	57.28	14.09	28.8	62.82	40.78	28.8	41.50	17.06	28.8	12.68	43.87
29.7	17.15	23.27	29.8	57.42	14.13	29.8	63.33	40.65	29.8	41.69	16.92	29.8	13.09	43.85
30.7	17.37	23.38	30.8	57.56	14.16	30.8	63.86	40.53	30.8	41.89	16.77	30.8	13.47	43.86
31.7	17.58	23.49	31.8	57.68	14.21	31.8	64.43	40.41	31.8	42.11	16.63	31.8	13.84	43.87
11.08	−11.04		6.20	−6.12		20.31	+20.29		7.73	+7.67		18.47	−18.44	
$5^{h}\ 46^{m}\ 26^{s}.439$			$6^{h}\ 47^{m}\ 3^{s}.489$			$7^{h}\ 1^{m}\ 34^{s}.861$			$7^{h}\ 13^{m}\ 29^{s}.477$			$7^{h}\ 16^{m}\ 40^{s}.555$		
−84° 49′ 48″.17			−80° 43′ 34″.16			+87° 11′ 0″.11			+82° 34′ 36″.50			−86° 54′ 0″.14		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			**ζ Octantis.** Mag. 5.4			**1 H. Draconis.** Mag. 4.6			**ζ Chamæleontis.** Mag. 5.2			**30 H. Camelop.** Mag. 5.3		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Sept.	8 15	+88 52	Sept.	9 8	−85 19	Sept.	9 25	+81 41	Sept.	9 36	−80 33	Sept.	10 20	+82 58
	s	″		s	″		s	″		s	″		s	″
0.9	1.68	54.09	0.9	40.72	46.94	0.9	14.76	40.69	0.9	13.34	58.29	0.9	56.61	56.68
1.9	2.40	53.77	1.9	40.85	46.68	1.9	14.82	40.33	1.9	13.39	58.01	1.9	56.62	56.30
2.9	3.18	53.44	2.9	40.95	46.44	2.9	14.87	39.95	2.9	13.44	57.75	2.9	56.64	55.91
3.9	4.06	53.12	3.9	41.07	46.19	3.9	14.96	39.56	3.9	13.49	57.50	3.9	56.68	55.50
4.9	5.03	52.79	4.9	41.18	45.96	4.9	15.04	39.17	4.9	13.54	57.26	4.9	56.73	55.09
5.9	6.09	52.47	5.9	41.27	45.71	5.9	15.14	38.81	5.9	13.58	56.99	5.9	56.81	54.67
6.9	7.19	52.19	6.9	41.35	45.44	6.9	15.26	38.46	6.9	13.61	56.72	6.9	56.89	54.28
7.9	8.29	51.95	7.9	41.43	45.18	7.9	15.37	38.12	7.9	13.65	56.45	7.9	56.97	53.90
8.9	9.36	51.71	8.9	41.51	44.87	8.9	15.49	37.80	8.9	13.68	56.14	8.9	57.06	53.54
9.9	10.36	51.48	9.9	41.61	44.55	9.9	15.59	37.52	9.9	13.71	55.83	9.9	57.12	53.20
10.9	11.28	51.25	10.9	41.74	44.23	10.9	15.68	37.23	10.9	13.76	55.50	10.9	57.19	52.88
11.9	12.15	51.02	11.9	41.89	43.95	11.9	15.76	36.93	11.9	13.82	55.19	11.9	57.25	52.54
12.9	12.99	50.77	12.9	42.06	43.67	12.9	15.82	36.62	12.9	13.89	54.88	12.9	57.29	52.20
13.9	13.83	50.51	13.9	42.23	43.43	13.9	15.91	36.30	13.9	13.97	54.61	13.9	57.33	51.84
14.9	14.72	50.23	14.9	42.42	43.21	14.9	15.99	35.96	14.9	14.05	54.37	14.9	57.37	51.47
15.9	15.68	49.94	15.9	42.59	42.99	15.9	16.07	35.33	15.9	14.14	54.14	15.9	57.42	51.10
16.9	16.69	49.65	16.9	42.77	42.79	16.9	16.18	35.25	16.9	14.22	53.90	16.9	57.50	50.71
17.9	17.80	49.37	17.9	42.92	42.58	17.9	16.28	34.89	17.9	14.28	53.67	17.9	57.58	50.30
18.9	18.94	49.13	18.9	43.08	42.35	18.9	16.41	34.55	18.9	14.35	53.44	18.9	57.67	49.92
19.8	20.11	48.88	19.9	43.22	42.15	19.9	16.54	34.23	19.9	14.42	53.20	19.9	57.77	49.55
20.8	21.28	48.65	20.9	43.38	41.92	20.9	16.68	33.93	20.9	14.48	52.95	20.9	57.88	49.19
21.8	22.46	48.46	21.9	43.52	41.67	21.9	16.80	33.64	21.9	14.55	52.68	21.9	57.98	48.84
22.8	23.61	48.27	22.9	43.69	41.40	22.9	16.93	33.35	22.9	14.62	52.41	22.9	58.09	48.51
23.8	24.73	48.08	23.9	43.87	41.15	23.9	17.04	33.08	23.9	14.70	52.13	23.9	58.20	48.18
24.8	25.81	47.92	24.9	44.04	40.91	24.9	17.15	32.82	24.9	14.78	51.87	24.9	58.29	47.88
25.8	26.83	47.73	25.9	44.24	40.63	25.9	17.26	32.56	25.9	14.87	51.61	25.9	58.38	47.56
26.8	27.82	47.52	26.9	44.46	40.42	26.9	17.36	32.29	26.9	14.96	51.36	26.9	58.47	47.24
27.8	28.81	47.33	27.9	44.69	40.23	27.9	17.47	32.00	27.9	15.06	51.11	27.9	58.54	46.91
28.8	29.83	47.11	28.9	44.92	40.03	28.9	17.57	31.70	28.9	15.17	50.89	28.9	58.61	46.56
29.8	30.88	46.88	29.9	45.16	39.89	29.9	17.68	31.38	29.9	15.28	50.71	29.9	58.70	46.19
30.8	32.02	46.65	30.9	45.39	39.74	30.9	17.81	31.06	30.9	15.40	50.52	30.9	58.79	45.81
31.8	33.25	46.42	31.9	45.61	39.59	31.9	17.94	30.74	31.9	15.51	50.37	31.9	58.90	45.42
	51.19	+51.18		12.28	−12.24		6.92	+6.85		6.10	−6.02		8.18	+8.12
8h 14m 48s.311			9h 9m 6s.085			9h 25m 12s.930			9h 36m 24s.003			10h 20m 57s.259		
+88° 53′ 11″.43			−85° 19′ 42″.77			+81° 41′ 57″.18			−80° 33′ 50″.61			+82° 59′ 12″.27		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

η Octantis. **Mag. 6.3**			**Bradley 1672.** Mag. 6.3			**ι Octantis.** Mag. 5.4			**32 H. Camelop.** ***seq.*** Mag. 5.3			**κ Octantis.** Mag. 5.6		
Wash. Mean Time.	**Right Ascension.**	**Declination.**	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Sept.	**10 59**	**−84 8**	Sept.	12 13	+88 9	Sept.	12 45	−84 40	Sept.	12 48	+83 51	Sept.	13 26	−85 21
	s	″		s	″		s	″		s	″		s	″
1.0	**40.08**	**50.78**	1.1	62.66	44.85	1.1	52.47	32.82	1.1	23.50	61.48	1.1	59.74	56.22
2.0	**40.09**	**50.49**	2.1	62.30	44.50	2.1	52.39	32.55	2.1	23.37	61.17	2.1	59.59	55.97
3.0	**40.10**	**50.19**	3.1	61.96	44.13	3.1	52.31	32.31	3.1	23.23	60.85	3.1	59.46	55.73
4.0	**40.11**	**49.93**	4.1	61.64	43.75	4.1	52.24	32.07	4.1	23.11	60.49	4.1	59.35	55.54
5.0	**40.11**	**49.67**	5.1	61.38	43.33	5.1	52.16	31.85	5.1	23.01	60.11	5.1	59.23	55.33
5.9	**40.10**	**49.41**	6.1	61.16	42.92	6.1	52.07	31.63	6.1	22.91	59.71	6.1	59.09	55.15
6.9	**40.09**	**49.15**	7.0	61.01	42.48	7.1	51.97	31.41	7.1	22.84	59.30	7.1	58.94	54.95
7.9	**40.06**	**48.86**	8.0	60.91	42.11	8.1	51.85	31.17	8.1	22.78	58.92	8.1	58.76	54.77
8.9	**40.03**	**48.55**	9.0	60.82	41.74	9.1	51.72	30.91	9.1	22.72	58.57	9.1	58.59	54.54
9.9	**40.02**	**48.22**	10.0	60.72	41.36	10.1	51.60	30.62	10.1	22.67	58.22	10.1	58.40	54.30
10.9	**40.02**	**47.87**	11.0	60.60	41.04	11.1	51.50	30.29	11.1	22.59	57.89	11.1	58.25	54.01
11.9	**40.03**	**47.53**	12.0	60.43	40.70	12.1	51.40	29.98	12.1	22.51	57.58	12.1	58.08	53.74
12.9	**40.07**	**47.19**	13.0	60.23	40.37	13.1	51.34	29.65	13.1	22.42	57.28	13.1	57.95	53.43
13.9	**40.12**	**46.86**	14.0	60.00	40.01	14.1	51.29	29.33	14.1	22.33	56.95	14.1	57.85	53.14
14.9	**40.18**	**46.57**	15.0	59.77	39.64	15.0	51.25	29.04	15.1	22.22	56.59	15.1	57.77	52.84
15.9	**40.24**	**46.28**	16.0	59.55	39.24	16.0	51.21	28.75	16.0	22.13	56.23	16.1	57.69	52.56
16.9	**40.31**	**46.00**	17.0	59.36	38.83	17.0	51.19	28.47	17.0	22.04	55.83	17.1	57.62	52.29
17.9	**40.36**	**45.73**	18.0	59.22	38.41	18.0	51.15	28.21	18.0	21.97	55.46	18.1	57.54	52.06
18.9	**40.40**	**45.46**	19.0	59.12	38.00	19.0	51.11	27.94	19.0	21.91	55.04	19.1	57.45	51.80
19.9	**40.44**	**45.19**	20.0	59.06	37.59	20.0	51.06	27.68	20.0	21.86	54.63	20.1	57.36	51.55
20.9	**40.48**	**44.90**	21.0	59.05	37.18	21.0	51.01	27.40	21.0	21.83	54.24	21.1	57.25	51.30
21.9	**40.52**	**44.59**	22.0	59.05	36.79	22.0	50.95	27.11	22.0	21.79	53.86	22.1	57.14	51.03
22.9	**40.56**	**44.28**	23.0	59.08	36.41	23.0	50.89	26.80	23.0	21.76	53.47	23.1	57.01	50.74
23.9	**40.60**	**43.97**	24.0	59.09	36.04	24.0	50.83	26.47	24.0	21.74	53.12	24.1	56.90	50.45
24.9	**40.65**	**43.65**	24.9	59.10	35.66	25.0	50.77	26.15	25.0	21.71	52.76	25.1	56.80	50.12
25.9	**40.72**	**43.31**	25.9	59.10	35.31	26.0	50.73	25.81	26.0	21.68	52.43	26.0	56.70	49.79
26.9	**40.80**	**42.98**	26.9	59.07	34.97	27.0	50.71	25.45	27.0	21.63	52.09	27.0	56.62	49.47
27.9	**40.90**	**42.69**	27.9	58.98	34.62	28.0	50.71	25.11	28.0	21.59	51.73	28.0	56.57	49.13
28.9	**41.02**	**42.40**	28.9	58.90	34.25	29.0	50.72	24.77	29.0	21.52	51.37	29.0	56.54	48.80
29.9	**41.14**	**42.11**	29.9	58.81	33.87	30.0	50.76	24.45	30.0	21.46	51.00	30.0	56.54	48.49
30.9	**41.26**	**41.86**	30.9	58.75	33.46	31.0	50.80	24.15	31.0	21.42	50.59	31.0	56.53	48.19
31.9	**41.36**	**41.64**	31.9	58.72	33.05	32.0	50.83	23.88	32.0	21.37	50.16	32.0	56.53	47.91
9.81		**−9.75**	31.16		+31.15	10.77		−10.73	9.36		+9.30	12.37		−12.33
10^{h}	**53^{m}**	**$55^{s}.642$**	12^{h}	14^{m}	$28^{s}.053$	12^{h}	46^{m}	$1^{s}.183$	12^{h}	48^{m}	$29^{s}.976$	13^{h}	27^{m}	$5^{s}.514$
−84°	**8′**	**31″.24**	+88°	9′	56″.03	−84°	40′	2″.72	+83°	52′	10″.05	−85°	21′	23″.59

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			Groombridge 2283. Mag. 7.2			ρ Octantis. Mag. 5.7			ε Ursæ Minoris. Mag. 4.4			59 G. Apodis. Mag. 5.9		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Sept.	14 13	−83 17	Sept.	15 3	+87 33	Sept.	15 23	−84 11	Sept.	16 54	+82 10	Sept.	17 15	−80 47
	s	″		s	″		s	″		s	″		s	″
1.1	19.36	37.98	1.2	35.74	25.47	1.2	50.85	51.14	1.3	27.24	48.15	1.3	55.88	28.21
2.1	19.24	37.78	2.2	35.18	25.33	2.2	50.68	51.01	2.3	27.06	48.21	2.3	55.77	28.22
3.1	19.14	37.58	3.2	34.60	25.18	3.2	50.53	50.88	3.3	26.87	48.23	3.3	55.66	28.22
4.1	19.04	37.40	4.2	34.02	25.00	4.2	50.38	50.77	4.3	26.67	48.25	4.3	55.56	28.24
5.1	18.94	37.23	5.2	33.45	24.76	5.2	50.24	50.68	5.2	26.48	48.24	5.3	55.47	28.28
6.1	18.82	37.08	6.2	32.90	24.52	6.2	50.09	50.61	6.2	26.28	48.21	6.3	55.39	28.32
7.1	18.70	36.94	7.2	32.39	24.26	7.2	49.92	50.54	7.2	26.09	48.15	7.3	55.29	28.39
8.1	18.57	36.79	8.2	31.91	24.01	8.2	49.74	50.46	8.2	25.91	48.07	8.3	55.17	28.46
9.1	18.42	36.61	9.2	31.47	23.78	9.2	49.54	50.37	9.2	25.73	47.99	9.3	55.05	28.51
10.1	18.28	36.41	10.2	31.04	23.56	10.2	49.34	50.26	10.2	25.56	47.91	10.2	54.92	28.53
11.1	18.13	36.19	11.2	30.60	23.33	11.2	49.14	50.12	11.2	25.39	47.86	11.2	54.78	28.57
12.1	18.00	35.93	12.2	30.15	23.12	12.2	48.93	49.95	12.2	25.22	47.83	12.2	54.62	28.56
13.1	17.88	35.67	13.2	29.68	22.95	13.2	48.75	49.76	13.2	25.05	47.80	13.2	54.48	28.50
14.1	17.77	35.40	14.1	29.18	22.77	14.2	48.59	49.55	14.2	24.87	47.79	14.2	54.35	28.45
15.1	17.68	35.14	15.1	28.66	22.56	15.2	48.44	49.36	15.2	24.69	47.78	15.2	54.24	28.40
16.1	17.60	34.89	16.1	28.13	22.34	16.2	48.30	49.16	16.2	24.50	47.75	16.2	54.13	28.33
17.1	17.52	34.66	17.1	27.60	22.11	17.2	48.16	48.98	17.2	24.31	47.70	17.2	54.03	28.27
18.1	17.44	34.44	18.1	27.10	21.86	18.2	48.03	48.82	18.2	24.12	47.62	18.2	53.93	28.22
19.1	17.36	34.22	19.1	26.61	21.57	19.1	47.90	48.66	19.2	23.93	47.54	19.2	53.82	28.18
20.1	17.26	34.00	20.1	26.16	21.30	20.1	47.75	48.51	20.2	23.74	47.42	20.2	53.71	28.15
21.1	17.17	33.77	21.1	25.72	21.01	21.1	47.59	48.35	21.2	23.56	47.30	21.2	53.59	28.13
22.1	17.06	33.55	22.1	25.32	20.72	22.1	47.42	48.18	22.2	23.38	47.17	22.2	53.47	28.10
23.1	16.95	33.29	23.1	24.93	20.42	23.1	47.25	48.01	23.2	23.22	47.02	23.2	53.35	28.07
24.1	16.84	33.02	24.1	24.55	20.15	24.1	47.07	47.81	24.2	23.06	46.90	24.2	53.21	28.03
25.1	16.73	32.75	25.1	24.18	19.88	25.1	46.90	47.61	25.2	22.89	46.78	25.2	53.08	27.96
26.1	16.63	32.45	26.1	23.80	19.63	26.1	46.73	47.37	26.2	22.73	46.67	26.2	52.93	27.87
27.1	16.54	32.14	27.1	23.40	19.38	27.1	46.58	47.13	27.2	22.57	46.57	27.2	52.79	27.77
28.1	16.47	31.83	28.1	22.99	19.14	28.1	46.43	46.88	28.2	22.40	46.48	28.2	52.66	27.64
29.1	16.41	31.52	29.1	22.56	18.89	29.1	46.30	46.61	29.2	22.22	46.40	29.2	52.54	27.49
30.1	16.36	31.22	30.1	22.10	18.64	30.1	46.19	46.36	30.2	22.04	46.30	30.2	52.43	27.34
31.1	16.33	30.94	31.1	21.64	18.35	31.1	46.10	46.11	31.2	21.86	46.20	31.2	52.34	27.21
32.1	16.30	30.68	32.1	21.19	18.04	32.1	46.01	45.87	32.2	21.67	46.06	32.2	52.25	27.07
	8.56	−8.50		23.45	+23.43		9.89	−9.84		7.35	+7.28		6.25	−6.17
14^h	13^m	$18^s.531$	15^h	4^m	$0^s.607$	15^h	23^m	$43^s.237$	16^h	54^m	$31^s.741$	17^h	15^m	$43^s.730$
−83°	17′	4″.27	+87°	33′	24″.43	−84°	11′	17″.84	+82°	10′	38″.40	−80°	47′	2″.69

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Ursæ Minoris. Mag. 4.4			**χ Octantis.** Mag. 5.2			**λ Ursæ Minoris.** Mag. 6.6			**σ Octantis.** Mag. 5.5			**76 Draconis.** Mag. 5.7		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Sept.	17 58	+86 37	Sept.	18 6	−87 40	Sept.	19 2	+89 1	Sept.	19 28	−89 13	Sept.	20 48	+82 13
	s	″		s	″		s	″		s	″		s	″
1.3	69.84	4.53	1.3	24.10	13.45	1.3	81.93	12.67	1.4	54.74	46.46	1.4	47.51	35.27
2.3	69.43	4.68	2.3	23.65	13.53	2.3	80.75	12.90	2.4	53.58	46.63	2.4	47.44	35.63
3.3	69.01	4.83	3.3	23.22	13.60	3.3	79.45	13.14	3.4	52.49	46.79	3.4	47.35	36.00
4.3	68.56	4.97	4.3	22.83	13.67	4.3	78.08	13.36	4.4	51.49	46.95	4.4	47.25	36.38
5.3	68.10	5.06	5.3	22.45	13.76	5.3	76.64	13.58	5.4	50.57	47.12	5.4	47.14	36.74
6.3	67.64	5.12	6.3	22.08	13.87	6.3	75.13	13.77	6.4	49.69	47.31	6.4	47.02	37.08
7.3	67.18	5.18	7.3	21.68	14.00	7.3	73.64	13.93	7.3	48.76	47.52	7.4	46.90	37.40
8.3	66.74	5.22	8.3	21.25	14.14	8.3	72.18	14.08	8.3	47.77	47.73	8.4	46.79	37.69
9.3	66.32	5.24	9.3	20.79	14.27	9.3	70.79	14.22	9.3	46.65	47.96	9.4	46.66	37.97
10.3	65.91	5.27	10.3	20.28	14.38	10.3	69.47	14.36	10.3	45.41	48.18	10.4	46.55	38.23
11.3	65.53	5.31	11.3	19.74	14.47	11.3	68.22	14.50	11.3	44.01	48.38	11.4	46.44	38.50
12.3	65.14	5.37	12.3	19.18	14.54	12.3	67.00	14.66	12.3	42.57	48.55	12.4	46.34	38.78
13.3	64.75	5.46	13.3	18.63	14.58	13.3	65.78	14.84	13.3	41.06	48.72	13.4	46.23	39.08
14.3	64.34	5.55	14.3	18.10	14.60	14.3	64.51	15.02	14.3	39.60	48.84	14.4	46.13	39.39
15.3	63.91	5.63	15.3	17.61	14.61	15.3	63.18	15.20	15.3	38.19	48.95	15.4	46.03	39.72
16.3	63.48	5.71	16.3	17.14	14.61	16.3	61.78	15.38	16.3	36.86	49.07	16.4	45.92	40.05
17.3	63.01	5.77	17.3	16.68	14.62	17.3	60.31	15.55	17.3	35.59	49.17	17.4	45.80	40.36
18.3	62.55	5.83	18.3	16.24	14.63	18.3	58.80	15.70	18.3	34.35	49.28	18.4	45.66	40.66
19.3	62.09	5.85	19.3	15.80	14.65	19.3	57.25	15.83	19.3	33.13	49.41	19.4	45.53	40.95
20.2	61.62	5.86	20.3	15.35	14.68	20.3	55.71	15.96	20.3	31.89	49.55	20.4	45.39	41.23
21.2	61.18	5.84	21.3	14.87	14.73	21.3	54.19	16.05	21.3	30.61	49.68	21.4	45.25	41.48
22.2	60.75	5.81	22.2	14.38	14.77	22.3	52.70	16.14	22.3	29.28	49.82	22.4	45.10	41.71
23.2	60.32	5.77	23.2	13.87	14.81	23.3	51.25	16.22	23.3	27.86	49.97	23.4	44.95	41.93
24.2	59.91	5.74	24.2	13.32	14.84	24.3	49.85	16.29	24.3	26.35	50.11	24.4	44.82	42.15
25.2	59.51	5.70	25.2	12.77	14.86	25.3	48.49	16.36	25.3	24.78	50.25	25.4	44.68	42.37
26.2	59.12	5.70	26.2	12.20	14.84	26.3	47.16	16.44	26.3	23.14	50.34	26.4	44.54	42.60
27.2	58.73	5.68	27.2	11.62	14.81	27.3	45.84	16.53	27.3	21.45	50.42	27.4	44.42	42.83
28.2	58.32	5.69	28.2	11.06	14.75	28.3	44.50	16.63	28.3	19.78	50.49	28.3	44.29	43.09
29.2	57.89	5.72	29.2	10.54	14.66	29.3	43.11	16.74	29.3	18.15	50.53	29.3	44.17	43.36
30.2	57.45	5.73	30.2	10.06	14.58	30.3	41.65	16.86	30.3	16.59	50.55	30.3	44.03	43.64
31.2	57.00	5.73	31.2	9.61	14.50	31.3	40.10	16.97	31.3	15.14	50.56	31.3	43.90	43.93
32.2	56.52	5.73	32.2	9.18	14.44	32.3	38.48	17.07	32.3	13.81	50.59	32.3	43.75	44.21
	16.95	+16.92		24.60	−24.58		58.52	+58.51		74.44	−74.43		7.39	+7.33
$17^h\ 59^m\ 20^s.805$			$18^h\ 5^m\ 36^s.163$			$19^h\ 3^m\ 51^s.560$			$19^h\ 26^m\ 7^s.189$			$20^h\ 48^m\ 44^s.660$		
+86° 36′ 51″.19			−87° 39′ 52″.21			+89° 0′ 56″.70			−89° 13′ 35″.99			+82° 13′ 16″.38		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			υ Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ^1 Octantis. Mag. 5.1		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Sept.	21 38	−83 6	Sept.	22 16	−86 23	Sept.	22 37	−81 49	Sept.	23 28	+86 50	Sept.	23 47	−82 28
	s	″		s	″		s	″		s	″		s	″
1.5	31.69	13.34	1.5	32.92	30.23	1.5	49.81	2.69	1.5	0.89	53.63	1.5	27.85	41.92
2.5	31.64	13.60	2.5	32.85	30.51	2.5	49.80	2.97	2.5	1.02	54.02	2.5	27.87	42.19
3.5	31.60	13.85	3.5	32.80	30.77	3.5	49.79	3.22	3.5	1.13	54.42	3.5	27.91	42.44
4.4	31.56	14.08	4.5	32.77	31.02	4.5	49.79	3.47	4.5	1.22	54.84	4.5	27.95	42.69
5.4	31.54	14.30	5.5	32.76	31.27	5.5	49.81	3.71	5.5	1.28	55.27	5.5	28.00	42.94
6.4	31.53	14.58	6.5	32.76	31.54	6.5	49.82	3.97	6.5	1.31	55.70	6.5	28.06	43.17
7.4	31.52	14.84	7.5	32.77	31.84	7.5	49.85	4.24	7.5	1.31	56.12	7.5	28.13	43.42
8.4	31.50	15.13	8.5	32.78	32.15	8.5	49.87	4.53	8.5	1.29	56.51	8.5	28.20	43.70
9.4	31.46	15.45	9.5	32.77	32.47	9.5	49.89	4.84	9.5	1.26	56.89	9.5	28.26	44.00
10.4	31.41	15.76	10.5	32.72	32.80	10.5	49.89	5.18	10.5	1.23	57.25	10.5	28.31	44.31
11.4	31.33	16.08	11.5	32.64	33.14	11.5	49.87	5.52	11.5	1.23	57.59	11.5	28.34	44.64
12.4	31.24	16.37	12.5	32.53	33.45	12.5	49.83	5.84	12.5	1.25	57.95	12.5	28.35	44.96
13.4	31.16	16.66	13.4	32.40	33.74	13.5	49.78	6.16	13.5	1.29	58.30	13.5	28.36	45.30
14.4	31.06	16.92	14.4	32.26	34.03	14.5	49.74	6.46	14.5	1.34	58.68	14.5	28.36	45.62
15.4	30.97	17.15	15.4	32.12	34.31	15.5	49.69	6.74	15.5	1.40	59.07	15.5	28.35	45.91
16.4	30.87	17.38	16.4	31.99	34.55	16.5	49.65	7.00	16.5	1.43	59.48	16.5	28.34	46.20
17.4	30.79	17.60	17.4	31.88	34.80	17.5	49.62	7.25	17.5	1.44	59.90	17.5	28.34	46.48
18.4	30.73	17.83	18.4	31.77	35.06	18.5	49.58	7.51	18.5	1.43	60.31	18.5	28.35	46.75
19.4	30.66	18.07	19.4	31.68	35.33	19.4	49.56	7.77	19.5	1.39	60.74	19.5	28.37	47.03
20.4	30.59	18.32	20.4	31.58	35.59	20.4	49.54	8.04	20.5	1.33	61.14	20.5	28.39	47.31
21.4	30.52	18.59	21.4	31.49	35.87	21.4	49.51	8.33	21.5	1.24	61.51	21.5	28.40	47.61
22.4	30.44	18.86	22.4	31.39	36.16	22.4	49.47	8.63	22.5	1.15	61.90	22.5	28.42	47.91
23.4	30.35	19.13	23.4	31.27	36.46	23.4	49.43	8.94	23.5	1.05	62.28	23.5	28.43	48.23
24.4	30.25	19.40	24.4	31.13	36.77	24.4	49.39	9.25	24.5	0.95	62.64	24.5	28.43	48.55
25.4	30.14	19.67	25.4	30.96	37.08	25.4	49.34	9.57	25.5	0.87	62.98	25.5	28.43	48.89
26.4	30.02	19.95	26.4	30.78	37.38	26.4	49.27	9.88	26.5	0.81	63.34	26.5	28.40	49.23
27.4	29.89	20.21	27.4	30.58	37.67	27.4	49.19	10.18	27.5	0.76	63.70	27.5	28.36	49.57
28.4	29.75	20.44	28.4	30.35	37.95	28.4	49.11	10.46	28.5	0.72	64.07	28.5	28.32	49.91
29.4	29.61	20.64	29.4	30.12	38.19	29.4	49.02	10.72	29.5	0.68	64.43	29.5	28.27	50.23
30.4	29.48	20.83	30.4	29.91	38.41	30.4	48.94	10.96	30.5	0.64	64.82	30.5	28.23	50.51
31.4	29.37	21.00	31.4	29.70	38.61	31.4	48.87	11.19	31.4	0.58	65.24	31.5	28.18	50.78
32.4	29.26	21.16	32.4	29.50	38.80	32.4	48.81	11.41	32.4	0.50	65.66	32.5	28.13	51.04
	8.33	−8.27		15.89	−15.86		7.03	−6.96		18.20	+18.17		7.64	−7.57
	21^h 38^m	$10^s.025$		22^h 15^m	$56^s.333$		22^h 37^m	$32^s.703$		23^h 27^m	$44^s.392$		23^h 47^m	$12^s.813$
	−83° 6′	23″.31		−86° 23′	45″.22		−81° 49′	21″.11		+86° 50′	39″.03		−82° 29′	8″.43

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			**α Ursæ Minoris.** (*Polaris.*) Mag. 2.1			**4 G. Octantis.** Mag. 5.6			**Groombridge 750.** Mag. 6.7			**Groombridge 944.** Mag. 6.4		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Oct.	0 57	+85 48	Oct.	1 31	+88 51	Oct.	1 42	−85 11	Oct.	4 10	+85 20	Oct.	5 35	+85 9
	s	″		s	″		s	″		s	″		s	″
0.5	22.75	45.86	0.5	1.72	41.58	0.5	19.66	12.59	0.6	10.68	0.15	0.7	16.97	17.32
1.5	22.85	46.26	1.5	2.27	41.97	1.5	19.69	12.88	1.6	11.00	0.35	1.7	17.32	17.37
2.5	22.95	46.68	2.5	2.77	42.37	2.5	19.74	13.15	2.6	11.32	0.56	2.7	17.67	17.45
3.5	23.01	47.12	3.5	3.19	42.79	3.5	19.80	13.41	3.6	11.62	0.82	3.7	18.01	17.53
4.5	23.05	47.54	4.5	3.51	43.21	4.5	19.86	13.67	4.6	11.91	1.09	4.7	18.36	17.67
5.5	23.06	47.96	5.5	3.74	43.63	5.5	19.95	13.94	5.6	12.19	1.36	5.7	18.68	17.81
6.5	23.07	48.36	6.5	3.92	44.00	6.5	20.03	14.22	6.6	12.42	1.63	6.7	18.97	17.95
7.5	23.07	48.75	7.5	4.06	44.38	7.5	20.11	14.55	7.6	12.65	1.88	7.7	19.25	18.09
8.5	23.06	49.08	8.5	4.24	44.73	8.5	20.16	14.88	8.6	12.87	2.12	8.7	19.52	18.22
9.5	23.07	49.43	9.5	4.46	45.07	9.5	20.20	15.24	9.6	13.09	2.33	9.7	19.78	18.32
10.5	23.11	49.77	10.5	4.74	45.41	10.5	20.22	15.58	10.6	13.32	2.53	10.7	20.05	18.41
11.5	23.16	50.12	11.5	5.08	45.77	11.5	20.22	15.94	11.6	13.56	2.73	11.7	20.32	18.46
12.5	23.20	50.48	12.5	5.45	46.13	12.5	20.20	16.28	12.6	13.83	2.94	12.7	20.62	18.54
13.5	23.25	50.87	13.5	5.81	46.51	13.5	20.18	16.61	13.6	14.11	3.16	13.7	20.92	18.63
14.5	23.30	51.28	14.5	6.14	46.90	14.5	20.16	16.92	14.6	14.38	3.39	14.7	21.24	18.74
15.5	23.32	51.69	15.5	6.41	47.30	15.5	20.15	17.23	15.6	14.64	3.66	15.7	21.57	18.87
16.5	23.33	52.10	16.5	6.61	47.71	16.5	20.14	17.52	16.6	14.92	3.92	16.7	21.89	19.01
17.5	23.33	52.50	17.5	6.72	48.13	17.5	20.15	17.80	17.6	15.16	4.22	17.7	22.20	19.18
18.5	23.29	52.91	18.5	6.77	48.54	18.5	20.14	18.10	18.6	15.39	4.52	18.7	22.49	19.36
19.5	23.24	53.30	19.5	6.80	48.93	19.5	20.16	18.38	19.6	15.61	4.82	19.7	22.77	19.56
20.5	23.18	53.68	20.5	6.74	49.31	20.5	20.17	18.71	20.6	15.81	5.11	20.7	23.04	19.75
21.5	23.13	54.04	21.5	6.68	49.68	21.5	20.17	19.02	21.6	16.00	5.40	21.7	23.29	19.93
22.5	23.06	54.38	22.5	6.63	50.04	22.5	20.16	19.35	22.6	16.18	5.70	22.6	23.53	20.11
23.5	23.01	54.71	23.5	6.60	50.40	23.5	20.12	19.71	23.6	16.35	5.96	23.6	23.77	20.29
24.4	22.96	55.04	24.5	6.62	50.74	24.5	20.08	20.06	24.6	16.53	6.22	24.6	24.01	20.44
25.4	22.93	55.39	25.5	6.66	51.07	25.5	20.02	20.43	25.6	16.73	6.48	25.6	24.26	20.59
26.4	22.92	55.74	26.5	6.76	51.44	26.5	19.93	20.77	26.6	16.94	6.72	26.6	24.53	20.71
27.4	22.91	56.10	27.5	6.89	51.81	27.5	19.85	21.10	27.6	17.16	6.95	27.6	24.80	20.86
28.4	22.90	56.48	28.5	7.00	52.19	28.5	19.75	21.41	28.6	17.40	7.24	28.6	25.09	21.02
29.4	22.87	56.90	29.5	7.07	52.60	29.5	19.66	21.70	29.6	17.63	7.54	29.6	25.40	21.20
30.4	22.83	57.30	30.5	7.07	53.01	30.5	19.58	21.96	30.6	17.87	7.86	30.6	25.70	21.41
31.4	22.75	57.70	31.4	6.96	53.44	31.5	19.50	22.23	31.6	18.08	8.21	31.6	25.99	21.64
13.70 +13.66			50.40 +50.39			11.92 −11.88			12.29 +12.25			11.84 +11.80		
$0^{h}\ 57^{m}\ 1^{s}.657$			$1^{h}\ 29^{m}\ 44^{s}.254$			$1^{h}\ 42^{m}\ 6^{s}.102$			$4^{h}\ 9^{m}\ 44^{s}.952$			$5^{h}\ 34^{m}\ 54^{s}.014$		
+85° 48′ 25″.87			+88° 51′ 25″.03			−85° 11′ 39″.58			+85° 20′ 1″.04			+85° 9′ 28″.07		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Mensæ. Mag. 6.2			**ζ Mensæ.** Mag. 5.6			**51 H. Cephei.** Mag. 5.3			**25 H. Camelop.** Mag. 5.1			**7 G. Octantis.** Mag. 6.4		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Oct.	5 46	−84 49	Oct.	6 46	−80 43	Oct.	7 2	+87 10	Oct.	7 13	+82 34	Oct.	7 16	−86 53
	s	″		s	″		s	″		s	″		s	″
0.7	17.37	23.38	0.8	57.56	14.16	0.8	3.86	40.53	0.8	41.89	16.77	0.8	13.47	43.86
1.7	17.58	23.49	1.8	57.68	14.21	1.8	4.43	40.41	1.8	42.11	16.63	1.8	13.84	43.87
2.7	17.78	23.58	2.8	57.81	14.21	2.8	5.02	40.32	2.8	42.35	16.52	2.8	14.17	43.86
3.7	17.98	23.66	3.7	57.93	14.23	3.8	5.62	40.28	3.8	42.59	16.44	3.8	14.51	43.82
4.7	18.21	23.72	4.7	58.06	14.22	4.8	6.22	40.23	4.8	42.82	16.39	4.8	14.84	43.78
5.7	18.41	23.77	5.7	58 18	14 21	5.8	6.79	40.24	5.8	43.04	16.35	5.8	15.20	43.73
6.7	18.63	23.82	6.7	58.31	14.19	6.8	7.32	40.22	6.8	43.25	16.33	6.8	15.58	43.68
7.7	18.87	23.90	7.7	58.46	14.18	7.7	7.83	40.21	7.8	43.44	16.31	7.8	15.99	43.62
8.7	19.11	24.02	8.7	58.59	14.20	8.7	8.31	40.21	8.8	43.63	16.28	8.8	16.40	43.56
9.7	19.36	24.15	9.7	58.74	14.24	9.7	8.78	40.18	9.7	43.80	16.23	9.8	16.84	43.58
10.7	19.59	24.32	10.7	58.88	14.31	10.7	9.25	40.14	10.7	43.99	16.17	10.7	17.28	43.61
11.7	19.82	24.50	11.7	59.03	14.42	11.7	9.74	40.09	11.7	44.17	16.08	11.7	17.71	43.67
12.7	20.04	24.69	12.7	59.17	14.56	12.7	10.25	40.03	12.7	44.36	16.00	12.7	18.13	43.74
13.7	20.23	24.89	13.7	59.31	14.67	13.7	10.79	39.97	13.7	44.58	15.93	13.7	18.52	43.82
14.7	20.43	25.07	14.7	59.43	14.78	14.7	11.36	39.91	14.7	44.80	15.87	14.7	18.89	43.90
15.7	20.62	25.24	15.7	59.56	14.89	15.7	11.93	39.90	15.7	45.02	15.81	15.7	19.27	43.95
16.7	20.81	25.41	16.7	59.69	15.00	16.7	12.50	39.89	16.7	45.25	15.77	16.7	19.62	44.01
17.7	21.01	25.57	17.7	59.81	15.08	17.7	13.07	39.92	17.7	45.47	15.77	17.7	19.98	44.06
18.7	21.20	25.71	18.7	59.94	15.15	18.7	13.63	39.95	18.7	45.69	15.79	18.7	20.34	44.09
19.7	21.39	25.85	19.7	60.06	15.24	19.7	14.17	40.00	19.7	45.89	15.82	19.7	20.71	44.14
20.7	21.60	26.00	20.7	60.19	15.31	20.7	14.69	40.07	20.7	46.10	15.86	20.7	21.10	44.17
21.7	21.82	26.18	21.7	60.32	15.41	21.7	15.20	40.14	21.7	46.29	15.88	21.7	21.51	44.22
22.7	22.04	26.36	22.7	60.46	15.54	22.7	15.67	40.20	22.7	46.48	15.91	22.7	21.91	44.28
23.7	22.24	26.55	23.7	60.60	15.67	23.7	16.13	40.24	23.7	46.66	15.92	23.7	22.34	44.36
24.6	22.44	26.78	24.7	60.74	15.81	24.7	16.59	40.27	24.7	46.84	15.94	24.7	22.76	44.47
25.6	22.65	27.03	25.7	60.87	15.98	25.7	17.06	40.30	25.7	47.02	15.94	25.7	23.19	44.61
26.6	22.83	27.30	26.7	61.01	16.20	26.7	17.56	40.31	26.7	47.20	15.94	26.7	23.59	44.74
27.6	23.01	27.58	27.7	61.13	16.42	27.7	18.06	40.31	27.7	47.41	15.92	27.7	23.97	44.93
28.6	23.16	27.84	28.7	61.26	16.62	28.7	18.61	40.32	28.7	47.63	15.91	28.7	24.33	45.10
29.6	23.31	28.10	29.7	61.36	16.80	29.7	19.18	40.37	29.7	47.85	15.91	29.7	24.66	45.26
30.6	23.45	28.34	30.7	61.46	17.00	30.7	19.76	40.42	30.7	48.08	15.96	30.7	24.97	45.41
31.6	23.59	28.56	31.7	61.57	17.18	31.7	20.34	40.52	31.7	48.32	16.01	31.7	25.29	45.55
11.08		−11.04	6.20		−6.12	20.31		+20.28	7.73		+7.67	18.46		−18.44
5^h	46^m	$26^s.439$	6^h	47^m	$3^s.489$	7^h	1^m	$34^s.861$	7^h	13^m	$29^s.477$	7^h	16^m	$40^s.555$
−84°	49′	48″.17	−80°	43′	34″.16	+87°	11′	0″.11	+82°	34′	36″.50	−86°	54′	0″.14

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			**ζ Octantis.** Mag. 5.4			**1 H. Draconis.** Mag. 4.6			**ζ Chamæleontis.** Mag. 5.2			**30 H. Camelop.** Mag. 5.3		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Oct.	8 15	+88 52	Oct.	9 8	−85 19	Oct.	9 25	+81 41	Oct.	9 36	−80 33	Oct.	10 20	+82 58
	s	″		s	″		s	″		s	″		s	″
0.8	32.02	46.65	0.9	45.39	39.74	0.9	17.81	31.06	0.9	15.40	50.52	0.9	58.79	45.81
1.8	33.25	46.42	1.9	45.61	39.59	1.9	17.94	30.74	1.9	15.51	50.37	1.9	58.90	45.42
2.8	34.54	46.21	2.9	45.81	39.46	2.9	18.09	30.42	2.9	15.60	50.21	2.9	59.04	45.04
3.8	35.90	46.01	3.8	46.01	39.32	3.9	18.24	30.11	3.9	15.70	50.04	3.9	59.18	44.68
4.8	37.27	45.86	4.8	46.20	39.16	4.9	18.42	29.83	4.9	15.78	49.85	4.9	59.33	44.34
5.8	38.61	45.71	5.8	46.38	38.97	5.9	18.58	29.59	5.9	15.87	49.66	5.9	59.48	44.01
6.8	39.91	45.57	6.8	46.58	38.78	6.9	18.74	29.36	6.9	15.97	49.44	6.9	59.63	43.70
7.8	41.11	45.47	7.8	46.79	38.58	7.8	18.88	29.13	7.9	16.07	49.22	7.9	59.77	43.42
8.8	42.24	45.34	8.8	47.02	38.40	8.8	19.01	28.92	8.9	16.17	49.02	8.9	59.90	43.14
9.8	43.32	45.20	9.8	47.26	38.23	9.8	19.13	28.70	9.9	16.29	48.83	9.9	60.00	42.86
10.8	44.40	45.05	10.8	47.53	38.09	10.8	19.25	28.46	10.9	16.42	48.65	10.9	60.10	42.56
11.8	45.50	44.88	11.8	47.81	37.99	11.8	19.37	28.19	11.8	16.55	48.51	11.9	60.20	42.24
12.8	46.65	44.71	12.8	48.08	37.88	12.8	19.50	27.92	12.8	16.69	48.38	12.9	60.32	41.92
13.8	47.86	44.53	13.8	48.35	37.81	13.8	19.64	27.65	13.8	16.82	48.28	13.9	60.45	41.59
14.8	49.15	44.37	14.8	48.60	37.73	14.8	19.79	27.37	14.8	16.94	48.18	14.9	60.59	41.25
15.8	50.48	44.22	15.8	48.85	37.65	15.8	19.95	27.12	15.8	17.06	48.07	15.9	60.74	40.92
16.8	51.84	44.09	16.8	49.09	37.57	16.8	20.12	26.87	16.8	17.18	47.97	16.9	60.89	40.60
17.8	53.22	43.99	17.8	49.33	37.49	17.8	20.30	26.63	17.8	17.29	47.85	17.9	61.07	40.31
18.8	54.58	43.89	18.8	49.56	37.39	18.8	20.47	26.44	18.8	17.41	47.74	18.9	61.24	40.02
19.8	55.92	43.83	19.8	49.79	37.30	19.8	20.64	26.24	19.8	17.52	47.61	19.9	61.41	39.75
20.8	57.22	43.76	20.8	50.03	37.18	20.8	20.80	26.05	20.8	17.63	47.49	20.9	61.56	39.50
21.8	58.48	43.70	21.8	50.28	37.09	21.8	20.95	25.87	21.8	17.75	47.35	21.8	61.72	39.26
22.8	59.69	43.65	22.8	50.54	36.98	22.8	21.10	25.71	22.8	17.88	47.22	22.8	61.88	39.01
23.8	60.85	43.59	23.8	50.81	36.91	23.8	21.25	25.54	23.8	18.02	47.12	23.8	62.01	38.78
24.8	31.98	43.50	24.8	51.10	36.85	24.8	21.39	25.36	24.8	18.16	47.02	24.8	62.15	38.53
25.8	63.13	43.42	25.8	51.38	36.80	25.8	21.52	25.18	25.8	18.31	46.94	25.8	62.29	38.27
26.7	64.29	43.32	26.8	51.70	36.79	26.8	21.68	24.96	26.8	18.46	46.88	26.8	62.43	38.00
27.7	65.53	43.23	27.8	51.99	36.80	27.8	21.82	24.75	27.8	18.61	46.85	27.8	62.58	37.72
28.7	66.85	43.11	28.8	52.28	36.81	28.8	22.00	24.52	28.8	18.75	46.84	28.8	62.74	37.42
29.7	68.23	43.02	29.8	52.54	36.84	29.8	22.17	24.30	29.8	18.90	46.86	29.8	62.92	37.13
30.7	69.67	42.96	30.8	52.78	36.86	30.8	22.36	24.10	30.8	19.02	46.85	30.8	63.11	36.85
31.7	71.14	42.90	31.8	53.02	36.86	31.8	22.56	23.94	31.8	19.15	46.83	31.8	63.31	36.58
51.11		+51.10	12.27		−12.23	6.92		+6.85	6.10		−6.02	8.18		+8.12
$8^{h}\ 14^{m}\ 48^{s}.311$			$9^{h}\ 9^{m}\ 6^{s}.085$			$9^{h}\ 25^{m}\ 12^{s}.930$			$9^{h}\ 36^{m}\ 24^{s}.003$			$10^{h}\ 20^{m}\ 57^{s}.259$		
+88° 53′ 11″.43			−85° 19′ 42″.77			+81° 41′ 57″.18			−80° 33′ 50″.61			+82° 59′ 12″.27		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

η Octantis. Mag. 6.3			Bradley 1672. Mag. 6.3			*ι* Octantis. Mag. 5.4			32 H. Camelop. *seq.* Mag. 5.3			*κ* Octantis. Mag. 5.6		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Oct.	10 59	−84 8	Oct.	12 13	+88 9	Oct.	12 45	−84 40	Oct.	12 48	+83 51	Oct.	13 26	−85 21
	s	″		s	″		s	″		s	″		s	″
0.9	41.26	41.86	0.9	58.75	33.46	1.0	50.80	24.15	1.0	21.42	50.59	1.0	56.53	48.19
1.9	41.36	41.64	1.9	58.72	33.05	2.0	50.83	23.88	2.0	21.37	50.16	2.0	56.53	47.91
2.9	41.47	41.42	2.9	58.75	32.62	2.9	50.86	23.62	3.0	21.36	49.73	3.0	56.52	47.65
3.9	41.57	41.20	3.9	58.83	32.18	3.9	50.87	23.35	3.9	21.36	49.31	4.0	56.49	47.39
4.9	41.65	40.95	4.9	58.98	31.74	4.9	50.88	23.09	4.9	21.36	48.88	5.0	56.44	47.13
5.9	41.72	40.68	5.9	59.17	31.34	5.9	50.87	22.81	5.9	21.39	48.47	6.0	56.39	46.85
6.9	41.81	40.38	6.9	59.35	30.96	6.9	50.86	22.50	6.9	21.42	48.08	7.0	56.34	46.55
7.9	41.91	40.09	7.9	59.51	30.59	7.9	50.86	22.18	7.9	21.43	47.71	8.0	56.28	46.22
8.9	42.01	39.79	8.9	59.65	30.25	8.9	50.86	21.84	8.9	21.44	47.36	9.0	56.26	45.86
9.9	42.15	39.51	9.9	59.75	29.90	9.9	50.91	21.50	9.9	21.43	47.00	10.0	56.25	45.51
10.9	42.30	39.24	10.9	59.79	29.54	10.9	50.97	21.17	10.9	21.41	46.65	11.0	56.25	45.17
11.9	42.45	39.00	11.9	59.83	29.18	11.9	51.05	20.82	11.9	21.40	46.29	12.0	56.30	44.82
12.9	42.61	38.76	12.9	59.87	28.81	12.9	51.13	20.51	12.9	21.38	45.91	12.9	56.36	44.49
13.9	42.78	38.54	13.9	59.95	28.39	13.9	51.23	20.22	13.9	21.37	45.50	13.9	56.41	44.20
14.9	42.93	38.36	14.9	60.06	27.98	14.9	51.32	19.94	14.9	21.37	45.09	14.9	56.47	43.92
15.9	43.09	38.16	15.9	60.22	27.59	15.9	51.40	19.67	15.9	21.39	44.67	15.9	56.52	43.64
16.9	43.24	37.97	16.9	60.43	27.17	16.9	51.47	19.42	16.9	21.43	44.26	16.9	56.57	43.34
17.9	43.37	37.77	17.9	60.67	26.77	17.9	51.55	19.14	17.9	21.47	43.84	17.9	56.60	43.06
18.9	43.51	37.55	18.9	60.94	26.40	18.9	51.61	18.87	18.9	21.52	43.43	18.9	56.62	42.79
19.9	43.64	37.33	19.9	61.24	26.01	19.9	51.68	18.59	19.9	21.58	43.05	19.9	56.65	42.49
20.9	43.77	37.10	20.9	61.51	25.67	20.9	51.74	18.31	20.9	21.64	42.67	20.9	56.63	42.17
21.9	43.92	36.87	21.9	61.83	25.33	21.9	51.80	17.99	21.9	21.69	42.30	21.9	56.69	41.85
22.9	44.07	36.65	22.9	62.11	24.99	22.9	51.88	17.68	22.9	21.74	41.96	22.9	56.74	41.53
23.9	44.25	36.42	23.9	62.35	24.67	23.9	51.96	17.35	23.9	21.80	41.61	23.9	56.79	41.20
24.9	44.44	36.21	24.9	62.58	24.34	24.9	52.06	17.04	24.9	21.84	41.27	24.9	56.88	40.87
25.9	44.63	36.01	25.9	62.77	24.00	25.9	52.20	16.74	25.9	21.86	40.91	25.9	56.97	40.53
26.9	44.84	35.84	26.9	62.96	23.64	26.9	52.35	16.45	26.9	21.89	40.54	26.9	57.10	40.20
27.9	45.05	35.70	27.9	63.16	23.27	27.9	52.50	16.16	27.9	21.92	40.16	27.9	57.23	39.91
28.9	45.25	35.56	28.9	63.39	22.88	28.9	52.66	15.94	28.9	21.97	39.74	28.9	57.37	39.64
29.9	45.45	35.45	29.9	63.68	22.49	29.9	52.80	15.72	29.9	22.02	39.33	29.9	57.51	39.40
30.9	45.64	35.34	30.9	64.00	22.10	30.9	52.96	15.51	30.9	22.10	38.92	30.9	57.64	39.15
31.8	45.81	35.22	31.9	64.42	21.70	31.9	53.09	15.31	31.9	22.19	38.49	31.9	57.75	38.91
	9.80	−9.75		31.10	+31.09		10.77	−10.72		9.35	+9.30		12.37	−12.33
10^h	59^m	$55^s.642$	12^h	14^m	$28^s.053$	12^h	46^m	$1^s.183$	12^h	48^m	$29^s.976$	13^h	27^m	$5^s.514$
−84°	8′	31″.24	+88°	9′	56″.03	−84°	40′	2″.72	+83°	52′	10″.05	−85°	21′	23″.59

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			**Groombridge 2283.** Mag. 7.2			**ρ Octantis.** Mag. 5.7			**ε Ursæ Minoris.** Mag. 4.4			**59 G. Apodis.** Mag. 5.9		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Oct.	14 13	−83 17	Oct.	15 3	+87 33	Oct.	15 23	−84 11	Oct.	16 54	+82 10	Oct.	17 15	−80 47
	s	″		s	″		s	″		s	″		s	″
1.1	16.33	30.94	1.1	21.64	18.35	1.1	46.10	46.11	1.2	21.86	46.20	1.2	52.34	27.21
2.1	16.30	30.68	2.1	21.19	18.04	2.1	46.01	45.87	2.2	21.67	46.06	2.2	52.25	27.07
3.1	16.27	30.43	3.1	20.75	17.73	3.1	45.92	45.66	3.2	21.48	45.90	3.2	52.16	26.96
4.1	16.23	30.18	4.1	20.34	17.36	4.1	45.83	45.47	4.2	21.30	45.70	4.2	52.08	26.88
5.1	16.17	29.94	5.1	20.00	17.02	5.1	45.71	45.27	5.2	21.13	45.48	5.2	51.98	26.81
6.1	16.11	29.69	6.1	19.69	16.66	6.1	45.59	45.05	6.2	20.97	45.26	6.2	51.86	26.73
7.0	16.04	29.42	7.1	19.39	16.32	7.1	45.47	44.82	7.2	20.82	45.05	7.2	51.74	26.64
8.0	15.97	29.11	8.1	19.10	16.01	8.1	45.31	44.57	8.2	20.66	44.85	8.2	51.61	26.51
9.0	15.90	28.77	9.1	18.81	15.72	9.1	45.18	44.30	9.2	20.52	44.68	9.2	51.48	26.34
10.0	15.86	28.44	10.1	18.50	15.43	10.1	45.07	44.00	10.2	20.36	44.53	10.2	51.36	26.16
11.0	15.83	28.10	11.1	18.15	15.15	11.1	44.96	43.68	11.2	20.20	44.37	11.2	51.25	25.97
12.0	15.82	27.75	12.1	17.79	14.87	12.1	44.89	43.36	12.1	20.05	44.24	12.2	51.15	25.76
13.0	15.82	27.44	13.1	17.42	14.56	13.1	44.82	43.05	13.1	19.88	44.08	13.2	51.05	25.54
14.0	15.83	27.12	14.1	17.05	14.25	14.1	44.76	42.75	14.1	19.71	43.91	14.2	50.96	25.33
15.0	15.83	26.85	15.1	16.69	13.91	15.1	44.71	42.47	15.1	19.55	43.70	15.2	50.88	25.15
16.0	15.84	26.56	16.1	16.35	13.55	16.1	44.66	42.20	16.1	19.38	43.48	16.2	50.80	24.97
17.0	15.84	26.28	17.1	16.05	13.17	17.1	44.61	41.94	17.1	19.22	43.25	17.2	50.72	24.78
18.0	15.83	26.00	18.1	15.78	12.81	18.1	44.53	41.69	18.1	19.07	42.99	18.1	50.64	24.62
19.0	15.82	25.72	19.1	15.53	12.44	19.1	44.46	41.43	19.1	18.96	42.73	19.1	50.55	24.46
20.0	15.80	25.43	20.0	15.32	12.06	20.1	44.38	41.16	20.1	18.79	42.47	20.1	50.45	24.29
21.0	15.79	25.12	21.0	15.11	11.72	21.1	44.29	40.89	21.1	18.65	42.21	21.1	50.35	24.10
22.0	15.77	24.80	22.0	14.92	11.38	22.1	44.21	40.58	22.1	18.52	41.97	22.1	50.25	23.91
23.0	15.76	24.48	23.0	14.73	11.03	23.1	44.13	40.27	23.1	18.40	41.73	23.1	50.14	23.69
24.0	15.75	24.15	24.0	14.52	10.72	24.1	44.06	39.95	24.1	18.27	41.51	24.1	50.04	23.45
24.9	15.77	23.81	25.0	14.30	10.41	25.0	44.01	39.59	25.1	18.14	41.29	25.1	49.94	23.19
25.9	15.80	23.46	26.0	14.06	10.09	26.0	43.98	39.24	26.1	18.01	41.07	26.1	49.86	22.93
26.9	15.84	23.12	27.0	13.80	9.78	27.0	43.96	38.90	27.1	17.86	40.85	27.1	49.78	22.66
27.9	15.90	22.79	28.0	13.52	9.44	28.0	43.96	38.57	28.1	17.72	40.62	28.1	49.72	22.37
28.9	15.96	22.50	29.0	13.25	9.07	29.0	43.97	38.27	29.1	17.57	40.38	29.1	49.67	22.12
29.9	16.04	22.24	30.0	13.00	8.68	30.0	43.98	37.98	30.1	17.43	40.13	30.1	49.62	21.87
30.9	16.10	21.99	31.0	12.80	8.28	31.0	44.00	37.73	31.1	17.29	39.82	31.1	49.58	21.64
31.9	16.16	21.73	32.0	12.64	7.86	32.0	44.00	37.46	32.1	17.16	39.50	32.1	49.54	21.44
8.56		−8.50	23.43		+23.41	9.89		−9.84	7.35		+7.28	6.25		−6.17
14^{h}	13^{m}	$18^{s}.531$	15^{h}	4^{m}	$0^{s}.607$	15^{h}	23^{m}	$43^{s}.237$	16^{h}	54^{m}	$31^{s}.741$	17^{h}	15^{m}	$43^{s}.730$
−83°	17′	4″.27	+87°	33′	24″.43	−84°	11′	17″.84	+82°	10′	38″.40	−80°	47′	2″.69

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Ursæ Minoris. Mag. 4.4			χ Octantis. Mag. 5.2			λ Ursæ Minoris. Mag. 6.6			σ Octantis. Mag. 5.5			76 Draconis. Mag. 5.7		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Oct.	17 58	+86 37	Oct.	18 5	−87 40	Oct.	19 1	+89 1	Oct.	19 27	−89 13	Oct.	20 48	+82 13
	s	″		s	″		s	″		s	″		s	″
1.2	57.00	5.73	1.2	69.61	14.50	1.3	100.10	16.97	1.3	75.14	50.56	1.3	43.90	43.93
2.2	56.52	5.73	2.2	69.18	14.44	2.3	98.48	17.07	2.3	73.81	50.59	2.3	43.75	44.21
3.2	56.04	5.68	3.2	68.77	14.36	3.3	96.81	17.16	3.3	72.52	50.63	3.3	43.58	44.46
4.2	55.57	5.59	4.2	68.35	14.33	4.3	95.14	17.21	4.3	71.24	50.69	4.3	43.41	44.69
5.2	55.12	5.50	5.2	67.91	14.31	5.3	93.50	17.22	5.3	69.92	50.76	5.3	43.24	44.89
6.2	54.69	5.38	6.2	67.43	14.29	6.3	91.92	17.22	6.3	68.50	50.84	6.3	43.08	45.08
7.2	54.27	5.27	7.2	66.91	14.25	7.2	90.43	17.23	7.3	66.96	50.91	7.3	42.92	45.24
8.2	53.87	5.17	8.2	66.37	14.18	8.2	89.02	17.24	8.3	65.31	50.96	8.3	42.76	45.39
9.2	53.49	5.09	9.2	65.82	14.07	9.2	87.65	17.26	9.3	63.57	50.98	9.3	42.61	45.56
10.2	53.11	5.03	10.2	65.27	13.93	10.2	86.30	17.28	10.3	61.79	50.99	10.3	42.47	45.74
11.2	52.72	4.97	11.2	64.74	13.78	11.2	84.93	17.34	11.3	60.04	50.97	11.3	42.32	45.94
12.2	52.31	4.94	12.2	64.25	13.62	12.2	83.52	17.39	12.3	58.35	50.93	12.3	42.18	46.14
13.2	51.88	4.88	13.2	63.79	13.47	13.2	82.03	17.46	13.2	56.75	50.86	13.3	42.03	46.36
14.2	51.44	4.80	14.2	63.36	13.32	14.2	80.49	17.50	14.2	55.24	50.81	14.3	41.88	46.57
15.2	51.00	4.74	15.2	62.95	13.19	15.2	78.90	17.53	15.2	53.79	50.78	15.3	41.71	46.77
16.2	50.55	4.64	16.2	62.55	13.05	16.2	77.28	17.53	16.2	52.40	50.73	16.3	41.54	46.95
17.2	50.11	4.52	17.2	62.14	12.92	17.2	75.67	17.53	17.2	51.00	50.69	17.3	41.37	47.11
18.2	49.68	4.37	18.2	61.73	12.82	18.2	74.08	17.49	18.2	49.57	50.66	18.3	41.19	47.25
19.2	49.27	4.20	19.2	61.29	12.71	19.2	72.52	17.45	19.2	48.12	50.64	19.3	41.01	47.38
20.2	48.89	4.04	20.2	60.83	12.59	20.2	71.01	17.39	20.2	46.61	50.61	20.3	40.83	47.49
21.2	48.50	3.88	21.2	60.36	12.45	21.2	69.55	17.32	21.2	45.04	50.59	21.3	40.66	47.59
22.2	48.13	3.72	22.2	59.88	12.30	22.2	68.16	17.25	22.2	43.39	50.57	22.3	40.49	47.68
23.2	47.77	3.56	23.2	59.39	12.14	23.2	66.81	17.19	23.2	41.69	50.52	23.3	40.33	47.77
24.2	47.42	3.41	24.2	58.90	11.96	24.2	65.49	17.15	24.2	39.97	50.44	24.3	40.17	47.88
25.2	47.06	3.28	25.2	58.42	11.75	25.2	64.15	17.13	25.2	38.26	50.34	25.3	40.02	48.00
26.2	46.69	3.18	26.2	57.98	11.51	26.2	62.79	17.10	26.2	36.59	50.23	26.3	39.86	48.13
27.1	46.30	3.06	27.2	57.57	11.26	27.2	61.38	17.07	27.2	35.00	50.10	27.3	39.70	48.27
28.1	45.90	2.93	28.2	57.22	11.02	28.2	59.90	17.05	28.2	33.53	49.95	28.3	39.54	48.42
29.1	45.50	2.79	29.1	56.88	10.79	29.2	58.33	17.01	29.2	32.19	49.79	29.3	39.37	48.56
30.1	45.07	2.61	30.1	56.58	10.57	30.2	56.72	16.95	30.2	30.92	49.65	30.3	39.19	48.68
31.1	44.65	2.43	31.1	56.29	10.37	31.2	55.10	16.87	31.2	29.72	49.53	31.3	39.01	48.79
32.1	44.25	2.20	32.1	55.99	10.19	32.2	53.50	16.76	32.2	28.49	49.43	32.3	38.81	48.87
	16.95	+16.92		24.60	−24.58		58.56	+58.55		74.49	−74.48		7.40	+7.33
17^h 59^m $20^s.805$			18^h 5^m $36^s.163$			19^h 3^m $51^s.560$			19^h 26^m $7^s.189$			20^h 48^m $44^s.660$		
+86° 36′ 51″.19			−87° 39′ 52″.21			+89° 0′ 56″.70			−89° 13′ 35″.99			+82° 13′ 16″.38		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			υ Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ^1 Octantis. Mag. 5.1		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Oct.	21 38	−83 6	Oct.	22 16	−86 23	Oct.	22 37	−81 49	Oct.	23 27	+86 51	Oct.	23 47	−82 28
	s	″		s	″		s	″		s	″		s	″
1.4	29.37	21.00	1.4	29.70	38.61	1.4	48.87	11.19	1.4	60.58	5.24	1.5	28.18	50.78
2.4	29.26	21.16	2.4	29.50	38.80	2.4	48.81	11.41	2.4	60.50	5.66	2.5	28.13	51.04
3.4	29.16	21.34	3.4	29.34	39.00	3.4	48.74	11.63	3.4	60.38	6.09	3.5	28.11	51.30
4.4	29.06	21.53	4.4	29.20	39.22	4.4	48.69	11.86	4.4	60.23	6.51	4.5	28.10	51.56
5.4	28.97	21.74	5.4	29.04	39.46	5.4	48.63	12.11	5.4	60.05	6.89	5.5	28.08	51.83
6.4	28.86	21.97	6.4	28.87	39.71	6.4	48.58	12.37	6.4	59.86	7.26	6.5	28.05	52.12
7.4	28.74	22.19	7.4	28.68	39.98	7.4	48.51	12.65	7.4	59.68	7.61	7.4	28.02	52.43
8.4	28.61	22.42	8.4	28.45	40.25	8.4	48.43	12.93	8.4	59.51	7.94	8.4	27.98	52.76
9.4	28.45	22.65	9.4	28.20	40.51	9.4	48.33	13.22	9.4	59.37	8.27	9.4	27.92	53.09
10.4	28.28	22.85	10.4	27.92	40.76	10.4	48.22	13.49	10.4	59.25	8.60	10.4	27.84	53.42
11.3	28.11	23.02	11.4	27.62	40.97	11.4	48.10	13.74	11.4	59.14	8.93	11.4	27.76	53.74
12.3	27.93	23.17	12.4	27.34	41.16	12.4	47.98	13.96	12.4	59.03	9.29	12.4	27.66	54.03
13.3	27.78	23.31	13.4	27.05	41.34	13.4	47.86	14.15	13.4	58.91	9.66	13.4	27.58	54.29
14.3	27.64	23.42	14.4	26.78	41.50	14.4	47.76	14.33	14.4	58.78	10.04	14.4	27.50	54.55
15.3	27.49	23.52	15.4	26.52	41.66	15.4	47.66	14.54	15.4	58.62	10.42	15.4	27.42	54.80
16.3	27.36	23.66	16.4	26.28	41.84	16.4	47.56	14.73	16.4	58.44	10.79	16.4	27.36	55.04
17.3	27.23	23.80	17.4	26.05	42.01	17.4	47.47	14.91	17.4	58.23	11.16	17.4	27.29	55.30
18.3	27.10	23.93	18.4	25.83	42.19	18.4	47.38	15.12	18.4	58.00	11.51	18.4	27.23	55.56
19.3	26.96	24.08	19.4	25.57	42.38	19.4	47.29	15.35	19.4	57.76	11.86	19.4	27.17	55.82
20.3	26.82	24.23	20.3	25.32	42.58	20.4	47.19	15.57	20.4	57.51	12.19	20.4	27.10	56.10
21.3	26.67	24.39	21.3	25.06	42.79	21.4	47.09	15.78	21.4	57.26	12.51	21.4	27.01	56.38
22.3	26.50	24.54	22.3	24.78	42.98	22.4	46.97	16.00	22.4	57.02	12.80	22.4	26.93	56.67
23.3	26.33	24.68	23.3	24.47	43.17	23.4	46.85	16.23	23.4	56.79	13.09	23.4	26.83	56.96
24.3	26.15	24.81	24.3	24.15	43.35	24.4	46.71	16.44	24.4	56.59	13.37	24.4	26.72	57.25
25.3	25.96	24.91	25.3	23.81	43.52	25.4	46.57	16.63	25.4	56.39	13.68	25.4	26.60	57.53
26.3	25.76	25.01	26.3	23.46	43.65	26.3	46.43	16.80	26.4	56.20	14.00	26.4	26.48	57.78
27.3	25.58	25.06	27.3	23.11	43.74	27.3	46.28	16.95	27.4	56.02	14.32	27.4	26.35	58.02
28.3	25.41	25.11	28.3	22.78	43.84	28.3	46.14	17.09	28.4	55.82	14.67	28.4	26.22	58.23
29.3	25.25	25.13	29.3	22.47	43.93	29.3	46.02	17.21	29.4	55.60	15.03	29.4	26.11	58.43
30.3	25.10	25.17	30.3	22.18	43.99	30.3	45.91	17.31	30.4	55.35	15.38	30.4	26.01	58.60
31.3	24.96	25.20	31.3	21.92	44.05	31.3	45.81	17.42	31.4	55.07	15.72	31.4	25.92	58.78
32.3	24.84	25.26	32.3	21.65	44.15	32.3	45.71	17.55	32.4	54.76	16.04	32.4	25.82	58.96
	8.33	−8.27		15.90	−15.87		7.03	−6.96		18.21	+18.19		7.64	−7.58
21^h	38^m	$10^s.025$	22^h	15^m	$56^s.333$	22^h	37^m	$32^s.703$	23^h	27^m	$44^s.392$	23^h	47^m	$12^s.813$
−83°	6′	23″.31	−86°	23′	45″.22	−81°	49′	21″.11	+86°	50′	39″.03	−82°	29′	8″.43

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			*α* **Ursæ Minoris.** (*Polaris.*) Mag. 2.1			**4 G. Octantis.** Mag. 5.6			**Groombridge 750.** Mag. 6.7			**Groombridge 944.** Mag. 6.4		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Nov.	0 57	+85 48	Nov.	1 30	+88 51	Nov.	1 42	−85 11	Nov.	4 10	+85 20	Nov.	5 35	+85 9
	s	″		s	″		s	″		s	″		s	″
0.4	22.75	57.70	0.4	66.96	53.44	0.5	19.50	22.23	0.6	18.08	8.21	0.6	25.99	21.64
1.4	22.65	58.09	1.4	66.76	53.86	1.5	19.45	22.50	1.6	18.27	8.56	1.6	26.28	21.91
2.4	22.52	58.47	2.4	66.49	54.25	2.5	19.40	22.78	2.6	18.44	8.93	2.6	26.52	22.15
3.4	22.40	58.82	3.4	66.17	54.62	3.5	19.35	23.07	3.6	18.59	9.26	3.6	26.75	22.41
4.4	22.27	59.15	4.4	65.86	54.97	4.5	19.27	23.39	4.6	18.72	9.59	4.6	26.97	22.66
5.4	22.16	59.47	5.4	65.59	55.30	5.4	19.19	23.72	5.6	18.84	9.88	5.6	27.16	22.88
6.4	22.05	59.77	6.4	65.37	55.63	6.4	19.09	24.06	6.5	18.96	10.15	6.6	27.36	23.09
7.4	21.96	60.08	7.4	65.21	55.96	7.4	18.95	24.39	7.5	19.11	10.42	7.6	27.58	23.27
8.4	21.91	60.39	8.4	65.10	56.29	8.4	18.82	24.72	8.5	19.28	10.70	8.6	27.80	23.46
9.4	21.83	60.73	9.4	65.00	56.65	9.4	18.66	25.02	9.5	19.45	10.97	9.6	28.04	23.64
10.4	21.75	61.07	10.4	64.86	57.01	10.4	18.51	25.31	10.5	19.62	11.29	10.6	28.28	23.86
11.4	21.66	61.44	11.4	64.67	57.38	11.4	18.36	25.58	11.5	19.80	11.60	11.6	28.54	24.08
12.4	21.56	61.80	12.4	64.42	57.76	12.4	18.22	25.82	12.5	19.96	11.94	12.6	28.79	24.32
13.4	21.42	62.15	13.4	64.10	58.14	13.4	18.09	26.06	13.5	20.11	12.30	13.6	29.03	24.59
14.4	21.28	62.50	14.4	63.69	58.52	14.4	17.97	26.30	14.5	20.25	12.66	14.6	29.26	24.87
15.4	21.11	62.82	15.4	63.23	58.89	15.4	17.84	26.57	15.5	20.35	13.03	15.6	29.46	25.16
16.4	20.94	63.13	16.4	62.72	59.22	16.4	17.72	26.83	16.5	20.46	13.39	16.6	29.66	25.46
17.4	20.75	63.43	17.4	62.20	59.56	17.4	17.60	27.09	17.5	20.55	13.72	17.6	29.84	25.75
18.4	20.57	63.72	18.4	61.66	59.88	18.4	17.46	27.38	18.5	20.62	14.06	18.6	30.01	26.03
19.4	20.40	64.00	19.4	61.15	60.20	19.4	17.32	27.66	19.5	20.69	14.40	19.6	30.16	26.31
20.4	20.22	64.26	20.4	60.67	60.48	20.4	17.15	27.95	20.5	20.76	14.71	20.6	30.31	26.56
21.4	20.07	64.53	21.4	60.22	60.77	21.4	16.98	28.25	21.5	20.83	15.00	21.6	30.48	26.81
22.4	19.94	64.79	22.4	59.82	61.06	22.4	16.79	28.54	22.5	20.91	15.30	22.6	30.65	27.04
23.4	19.80	65.06	23.4	59.46	61.38	23.4	16.56	28.79	23.5	21.02	15.60	23.6	30.83	27.28
24.4	19.68	65.36	24.4	59.11	61.69	24.4	16.35	29.03	24.5	21.13	15.91	24.6	31.02	27.51
25.4	19.54	65.68	25.4	58.73	62.04	25.4	16.13	29.23	25.5	21.26	16.22	25.6	31.24	27.77
26.4	19.38	66.00	26.4	58.28	62.39	26.4	15.94	29.42	26.5	21.37	16.59	26.6	31.45	28.05
27.4	19.20	66.33	27.4	57.76	62.75	27.4	15.74	29.60	27.5	21.48	16.96	27.6	31.65	28.36
28.4	19.01	66.65	28.4	57.12	63.11	28.4	15.56	29.76	28.5	21.56	17.34	28.5	31.84	28.69
29.3	18.78	66.95	29.4	56.40	63.46	29.4	15.39	29.94	29.5	21.61	17.72	29.5	32.00	29.03
30.3	18.54	67.22	30.4	55.64	63.75	30.4	15.23	30.12	30.5	21.65	18.11	30.5	32.14	29.37
31.3	18.30	67.45	31.4	54.85	64.05	31.4	15.05	30.34	31.5	21.66	18.45	31.5	32.25	29.71
13.71		+13.67	50.55		+50.54	11.93		−11.89	12.30		+12.26	11.84		+11.80
$0^{h}\ 57^{m}\ 1^{s}.657$			$1^{h}\ 29^{m}\ 44^{s}.254$			$1^{h}\ 42^{m}\ 6^{s}.102$			$4^{h}\ 9^{m}\ 44^{s}.952$			$5^{h}\ 34^{m}\ 54^{s}.014$		
+85° 48′ 25″.87			+88° 51′ 25″.03			−85° 11′ 39″.58			+85° 20′ 1″.04			+85° 9′ 28″.07		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Mensæ. Mag. 6.2			ζ Mensæ. Mag. 5.6			51 H. Cephei. Mag. 5.3			25 H. Camelop. Mag. 5.1			7 G. Octantis. Mag. 6.4		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Nov.	5 46	−84 49	Nov.	6 47	−80 43	Nov.	7 2	+87 10	Nov.	7 13	+82 34	Nov.	7 16	−86 53
	s	″		s	″		s	″		s	″		s	″
0.6	23.59	28.56	0.7	1.57	17.18	0.7	20.34	40.52	0.7	48.32	16.01	0.7	25.29	45.55
1.6	23.73	28.76	1.7	1.68	17.32	1.7	20.91	40.65	1.7	48.54	16.11	1.7	25.60	45.65
2.6	23.90	28.97	2.7	1.79	17.48	2.7	21.43	40.78	2.7	48.75	16.21	2.7	25.93	45.76
3.6	24.07	29.19	3.7	1.90	17.65	3.7	21.92	40.92	3.7	48.95	16.31	3.7	26.29	45.87
4.6	24.24	29.43	4.7	2.03	17.83	4.7	22.38	41.04	4.7	49.12	16.43	4.7	26.67	46.01
5.6	24.42	29.70	5.7	2.16	18.02	5.7	22.81	41.15	5.7	49.30	16.52	5.7	27.06	46.18
6.6	24.57	29.98	6.7	2.28	18.25	6.7	23.23	41.25	6.7	49.47	16.59	6.7	27.44	46.35
7.6	24.73	30.31	7.7	2.40	18.51	7.7	23.68	41.32	7.7	49.63	16.63	7.7	27.83	46.59
8.6	24.88	30.64	8.6	2.51	18.80	8.7	24.14	41.40	8.7	49.81	16.68	8.7	28.20	46.81
9.6	25.01	30.98	9.6	2.62	19.09	9.7	24.60	41.47	9.7	49.99	16.73	9.7	28.53	47.05
10.6	25.11	31.30	10.6	2.72	19.36	10.7	25.11	41.56	10.7	50.19	16.79	10.7	28.85	47.28
11.6	25.22	31.60	11.6	2.82	19.64	11.7	25.62	41.66	11.7	50.40	16.88	11.7	29.15	47.53
12.6	25.32	31.89	12.6	2.91	19.89	12.7	26.13	41.80	12.7	50.62	16.97	12.7	29.44	47.76
13.6	25.43	32.18	13.6	3.00	20.16	13.6	26.65	41.94	13.7	50.83	17.09	13.7	29.71	47.98
14.6	25.53	32.46	14.6	3.09	20.40	14.6	27.14	42.11	14.7	51.03	17.23	14.7	29.99	48.17
15.6	25.63	32.73	15.6	3.18	20.63	15.6	27.62	42.29	15.6	51.22	17.40	15.7	30.27	48.38
16.6	25.75	33.00	16.6	3.28	20.85	16.6	28.09	42.48	16.6	51.40	17.56	16.6	30.56	48.58
17.6	25.86	33.29	17.6	3.37	21.11	17.6	28.51	42.67	17.6	51.57	17.70	17.6	30.88	48.81
18.6	25.99	33.57	18.6	3.47	21.34	18.6	28.92	42.85	18.6	51.73	17.86	18.6	31.19	49.02
19.6	26.11	33.88	19.6	3.57	21.62	19.6	29.30	43.04	19.6	51.88	18.03	19.6	31.50	49.23
20.6	26.22	34.21	20.6	3.67	21.91	20.6	29.68	43.21	20.6	52.04	18.18	20.6	31.82	49.49
21.6	26.31	34.56	21.6	3.76	22.23	21.6	30.06	43.38	21.6	52.18	18.32	21.6	32.14	49.76
22.6	26.40	34.94	22.6	3.84	22.56	22.6	30.46	43.52	22.6	52.36	18.45	22.6	32.44	50.05
23.6	26.49	35.31	23.6	3.93	22.90	23.6	30.87	43.66	23.6	52.52	18.57	23.6	32.72	50.36
24.6	26.54	35.69	24.6	4.01	23.27	24.6	31.29	43.81	24.6	52.69	18.69	24.6	32.96	50.68
25.6	26.58	36.03	25.6	4.07	23.61	25.6	31.76	43.96	25.6	52.89	18.81	25.6	33.18	50.99
26.6	26.61	36.38	26.6	4.13	23.94	26.6	32.24	44.14	26.6	53.07	18.94	26.6	33.37	51.30
27.6	26.64	36.71	27.6	4.20	24.24	27.6	32.72	44.35	27.6	53.28	19.13	27.6	33.55	51.57
28.6	26.69	37.01	28.6	4.25	24.52	28.6	33.18	44.58	28.6	53.46	19.32	28.6	33.73	51.85
29.6	26.71	37.29	29.6	4.30	24.81	29.6	33.60	44.82	29.6	53.65	19.56	29.6	33.92	52.08
30.5	26.75	37.60	30.6	4.37	25.09	30.6	33.98	45.09	30.6	53.80	19.78	30.6	34.13	52.32
31.5	26.81	37.91	31.6	4.43	25.37	31.6	34.33	45.35	31.6	53.94	20.03	31.6	34.35	52.60
	11.08	−11.04		6.20	−6.12		20.31	+20.29		7.73	+7.67		18.47	−18.45
$5^{h}\ 46^{m}\ 26^{s}.439$			$6^{h}\ 47^{m}\ 3^{s}.489$			$7^{h}\ 1^{m}\ 34^{s}.861$			$7^{h}\ 13^{m}\ 29^{s}.477$			$7^{h}\ 16^{m}\ 40^{s}.555$		
−84° 49′ 48″.17			−80° 43′ 34″.16			+87° 11′ 0″.11			+82° 34′ 36″.50			−86° 54′ 0″.14		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			**ζ Octantis.** Mag. 5.4			**1 H. Draconis.** Mag. 4.6			**ζ Chamæleontis.** Mag. 5.2			**30 H. Camelop.** Mag. 5.3		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Nov.	8 16	+88 52	Nov.	9 8	−85 19	Nov.	9 25	+81 41	Nov.	9 36	−80 33	Nov.	10 21	+82 58
	s	″		s	″		s	″		s	″		s	″
0.7	11.14	42.90	0.8	53.02	36.86	0.8	22.56	23.94	0.8	19.15	46.83	0.8	3.31	36.58
1.7	12.60	42.89	1.8	53.25	36.85	1.8	22.76	23.79	1.8	19.27	46.79	1.8	3.51	36.34
2.7	13.98	42.89	2.8	53.49	36.85	2.8	22.95	23.66	2.8	19.39	46.75	2.8	3.72	36.13
3.7	15.29	42.91	3.8	53.76	36.83	3.8	23.13	23.56	3.8	19.52	46.70	3.8	3.91	35.94
4.7	16.52	42.93	4.8	54.02	36.80	4.8	23.29	23.46	4.8	19.65	46.64	4.8	4.09	35.76
5.7	17.68	42.94	5.8	54.30	36.78	5.8	23.44	23.35	5.8	19.79	46.61	5.8	4.24	35.59
6.7	18.80	42.94	6.8	54.61	36.82	6.8	23.59	23.23	6.8	19.94	46.60	6.8	4.40	35.42
7.7	19.91	42.92	7.8	54.92	36.87	7.8	23.73	23.10	7.8	20.10	46.62	7.8	4.55	35.21
8.7	21.08	42.89	8.8	55.22	36.94	8.8	23.88	22.95	8.8	20.26	46.66	8.8	4.70	34.98
9.7	22.30	42.85	9.7	55.51	37.03	9.8	24.06	22.80	9.8	20.41	46.71	9.8	4.87	34.76
10.7	23.58	42.83	10.7	55.80	37.14	10.8	24.23	22.65	10.8	20.56	46.77	10.8	5.06	34.52
11.7	24.91	42.81	11.7	56.07	37.23	11.8	24.40	22.50	11.8	20.71	46.84	11.8	5.24	34.32
12.7	26.27	42.81	12.7	56.32	37.33	12.8	24.60	22.39	12.8	20.85	46.92	12.8	5.44	34.11
13.7	27.64	42.84	13.7	56.57	37.42	13.7	24.78	22.28	13.8	20.98	46.97	13.8	5.65	33.92
14.7	29.00	42.90	14.7	56.81	37.49	14.7	24.98	22.19	14.8	21.11	47.03	14.8	5.86	33.74
15.7	30.33	42.96	15.7	57.06	37.55	15.7	25.17	22.13	15.8	21.24	47.07	15.8	6.07	33.59
16.7	31.61	43.05	16.7	57.30	37.62	16.7	25.36	22.08	16.7	21.37	47.12	16.8	6.28	33.45
17.7	32.85	43.14	17.7	57.57	37.68	17.7	25.53	22.03	17.7	21.50	47.16	17.8	6.48	33.33
18.7	34.02	43.23	18.7	57.83	37.77	18.7	25.71	22.02	18.7	21.64	47.23	18.8	6.68	33.22
19.7	35.14	43.31	19.7	58.10	37.85	19.7	25.86	21.99	19.7	21.78	47.29	19.8	6.86	33.12
20.7	36.22	43.40	20.7	58.38	37.96	20.7	26.01	21.95	20.7	21.93	47.38	20.8	7.03	33.02
21.7	37.30	43.45	21.7	58.67	38.09	21.7	26.16	21.90	21.7	22.08	47.46	21.8	7.19	32.90
22.7	38.37	43.49	22.7	58.96	38.26	22.7	26.32	21.85	22.7	22.23	47.58	22.8	7.37	32.76
23.7	39.49	43.54	23.7	59.25	38.43	23.7	26.48	21.77	23.7	22.39	47.72	23.8	7.55	32.61
24.7	40.68	43.59	24.7	59.52	38.62	24.7	26.66	21.69	24.7	22.54	47.88	24.8	7.74	32.45
25.7	41.93	43.64	25.7	59.77	38.83	25.7	26.84	21.62	25.7	22.68	48.06	25.8	7.94	32.30
26.7	43.25	43.72	26.7	60.00	39.03	26.7	27.03	21.56	26.7	22.81	48.23	26.8	8.16	32.15
27.7	44.61	43.80	27.7	60.22	39.22	27.7	27.23	21.51	27.7	22.94	48.41	27.7	8.39	32.02
28.7	45.93	43.93	28.7	60.43	39.40	28.7	27.44	21.51	28.7	23.06	48.57	28.7	8.61	31.92
29.7	47.22	44.06	29.7	60.65	39.55	29.7	27.64	21.51	29.7	23.17	48.72	29.7	8.84	31.84
30.7	48.42	44.23	30.7	60.86	39.71	30.7	27.82	21.56	30.7	23.29	48.85	30.7	9.06	31.78
31.6	49.52	44.40	31.7	61.09	39.86	31.7	28.00	21.60	31.7	23.42	48.99	31.7	9.26	31.73
	51.10	+51.09		12.27	−12.23		6.92	+6.85		6.10	−6.02		8.18	+8.12
$8^h\ 14^m\ 48^s.311$			$9^h\ 9^m\ 6^s.085$			$9^h\ 25^m\ 12^s.930$			$9^h\ 36^m\ 24^s.003$			$10^h\ 20^m\ 57^s.259$		
+88° 53′ 11″.43			−85° 19′ 42″.77			+81° 41′ 57″.18			−80° 33′ 50″.61			+82° 59′ 12″.27		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

η Octantis. Mag. 6.3			Bradley 1672. Mag. 6.3			ι Octantis. Mag. 5.4			32 H. Camelop. *seq.* Mag. 5.3			κ Octantis. Mag. 5.6		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Nov.	10 59	−84 8	Nov.	12 14	+88 9	Nov.	12 45	−84 40	Nov.	12 48	+83 51	Nov.	13 26	−85 21
	s	″		s	″		s	″		s	″		s	″
0.8	45.81	35.22	0.9	4.42	21.70	0.9	53.09	15.31	0.9	22.19	38.49	0.9	57.75	38.91
1.8	45.97	35.08	1.9	4.86	21.31	1.9	53.20	15.10	1.9	22.30	38.11	1.9	57.84	38.67
2.8	46.13	34.96	2.9	5.32	20.99	2.9	53.31	14.86	2.9	22.41	37.72	2.9	57.92	38.40
3.8	46.30	34.79	3.9	5.75	20.67	3.9	53.42	14.60	3.9	22.52	37.37	3.9	58.01	38.13
4.8	46.49	34.62	4.9	6.18	20.35	4.9	53.55	14.32	4.9	22.61	37.05	4.9	58.10	37.82
5.8	46.69	34.44	5.9	6.56	20.06	5.9	53.69	14.04	5.9	22.70	36.73	5.9	58.23	37.50
6.8	46.92	34.30	6.9	6.90	19.75	6.9	53.86	13.78	6.9	22.78	36.42	6.9	58.37	37.18
7.8	47.14	34.18	7.9	7.20	19.47	7.9	54.05	13.51	7.9	22.85	36.10	7.9	58.55	36.90
8.8	47.38	34.08	8.9	7.51	19.16	8.9	54.25	13.25	8.9	22.91	35.76	8.9	58.73	36.61
9.8	47.62	34.03	9.9	7.82	18.84	9.9	54.45	13.02	9.9	22.99	35.39	9.9	58.93	36.33
10.8	47.85	33.96	10.9	8.19	18.51	10.9	54.65	12.83	10.9	23.07	35.03	10.9	59.12	36.09
11.8	48.07	33.89	11.9	8.59	18.17	11.9	54.86	12.64	11.9	23.17	34.66	11.9	59.32	35.86
12.8	48.28	33.85	12.9	9.05	17.82	12.9	55.04	12.45	12.9	23.29	34.30	12.9	59.50	35.63
13.8	48.48	33.80	13.9	9.54	17.50	13.9	55.23	12.27	13.9	23.42	33.94	13.9	59.68	35.41
14.8	48.68	33.74	14.9	10.07	17.18	14.9	55.40	12.08	14.9	23.56	33.57	14.9	59.85	35.19
15.8	48.88	33.69	15.9	10.62	16.89	15.9	55.57	11.89	15.9	23.69	33.23	15.9	60.00	34.97
16.8	49.07	33.61	16.9	11.16	16.61	16.9	55.73	11.71	16.9	23.83	32.89	16.9	60.16	34.76
17.8	49.27	33.53	17.9	11.71	16.33	17.9	55.90	11.50	17.9	23.98	32.61	17.9	60.31	34.50
18.8	49.48	33.46	18.9	12.24	16.09	18.9	56.07	11.30	18.9	24.12	32.30	18.9	60.49	34.24
19.8	49.70	33.40	19.8	12.75	15.84	19.9	56.26	11.10	19.9	24.26	32.01	19.9	60.67	33.98
20.8	49.94	33.34	20.8	13.23	15.60	20.9	56.47	10.89	20.9	24.38	31.74	20.9	60.87	33.73
21.8	50.17	33.29	21.8	13.67	15.38	21.9	56.69	10.68	21.9	24.48	31.47	21.9	61.09	33.50
22.8	50.43	33.29	22.8	14.10	15.14	22.9	56.93	10.51	22.9	24.60	31.18	22.9	61.33	33.27
23.8	50.68	33.28	23.8	14.55	14.86	23.9	57.18	10.35	23.9	24.71	30.88	23.9	61.59	33.06
24.8	50.93	33.31	24.8	15.00	14.59	24.9	57.43	10.23	24.9	24.84	30.55	24.9	61.86	32.87
25.8	51.18	33.37	25.8	15.49	14.31	25.9	57.70	10.14	25.9	24.97	30.23	25.9	62.13	32.72
26.8	51.41	33.43	26.8	16.05	14.03	26.9	57.93	10.02	26.9	25.12	29.89	26.9	62.37	32.57
27.8	51.62	33.50	27.8	16.65	13.74	27.8	58.16	9.94	27.9	25.29	29.55	27.9	62.61	32.45
28.8	51.82	33.56	28.8	17.30	13.45	28.8	58.37	9.87	28.8	25.48	29.23	28.9	62.83	32.32
29.8	52.02	33.59	29.8	18.00	13.22	29.8	58.57	9.77	29.8	25.66	28.94	29.9	63.03	32.17
30.8	52.22	33.60	30.8	18.66	13.00	30.8	58.76	9.66	30.8	25.85	28.66	30.9	63.23	32.00
31.8	52.43	33.61	31.8	19.31	12.81	31.8	58.97	9.52	31.8	26.03	28.42	31.9	63.45	31.82
9.80		−9.75	31.05		+31.04	10.77		−10.72	9.35		+9.29	12.36		−12.32
10^h	59^m	$55^s.642$	12^h	14^m	$28^s.053$	12^h	46^m	$1^s.183$	12^h	48^m	$29^s.976$	13^h	27^m	$5^s.514$
−84°	8′	31″.24	+88°	9′	56″.03	−84°	40′	2″.72	+83°	52′	10″.05	−85°	21′	23″.59

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			Groombridge 2283. Mag. 7.2			ρ Octantis. Mag. 5.7			ε Ursæ Minoris. Mag. 4.4			59 G. Apodis. Mag. 5.9		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Nov.	14 13	−83 17	Nov.	15 3	+87 32	Nov.	15 23	−84 11	Nov.	16 54	+82 10	Nov.	17 15	−80 47
	s	″		s	″		s	″		s	″		s	″
0.9	16.16	21.73	1.0	12.64	67.86	1.0	44.00	37.46	1.1	17.16	39.50	1.1	49.54	21.44
1.9	16.19	21.47	2.0	12.51	67.45	2.0	43.98	37.20	2.1	17.05	39.15	2.1	49.47	21.24
2.9	16.22	21.19	3.0	12.41	67.05	3.0	43.95	36.92	3.1	16.94	38.82	3.1	49.41	21.03
3.9	16.25	20.90	4.0	12.33	66.68	4.0	43.92	36.62	4.1	16.83	38.51	4.1	49.33	20.80
4.9	16.28	20.57	5.0	12.25	66.34	5.0	43.90	36.30	5.1	16.73	38.22	5.1	49.25	20.53
5.9	16.32	20.25	6.0	12.17	65.98	6.0	43.88	35.97	6.1	16.64	37.95	6.1	49.18	20.27
6.9	16.39	19.91	6.9	12.05	65.66	7.0	43.88	35.62	7.1	16.54	37.70	7.1	49.11	19.96
7.9	16.47	19.58	7.9	11.91	65.35	8.0	43.91	35.26	8.1	16.42	37.47	8.1	49.05	19.65
8.9	16.56	19.26	8.9	11.75	65.03	9.0	43.95	34.92	9.1	16.31	37.21	9.1	49.00	19.33
9.9	16.67	18.96	9.9	11.60	64.65	10.0	44.00	34.56	10.1	16.20	36.94	10.1	48.98	19.01
10.9	16.78	18.68	10.9	11.45	64.29	11.0	44.06	34.26	11.1	16.09	36.65	11.1	48.96	18.71
11.9	16.89	18.42	11.9	11.35	63.91	11.9	44.12	33.96	12.1	15.98	36.34	12.1	48.94	18.43
12.9	16.99	18.17	12.9	11.25	63.51	12.9	44.18	33.66	13.1	15.88	36.01	13.1	48.91	18.16
13.9	17.09	17.93	13.9	11.19	63.11	13.9	44.24	33.39	14.1	15.77	35.66	14.1	48.89	17.90
14.9	17.18	17.69	14.9	11.17	62.71	14.9	44.28	33.12	15.1	15.69	35.31	15.1	48.86	17.64
15.9	17.27	17.44	15.9	11.16	62.32	15.9	44.32	32.84	16.1	15.61	34.96	16.1	48.82	17.39
16.9	17.35	17.17	16.9	11.19	61.93	16.9	44.35	32.56	17.0	15.54	34.61	17.1	48.79	17.13
17.9	17.43	16.90	17.9	11.23	61.54	17.9	44.38	32.25	18.0	15.47	34.26	18.1	48.75	16.85
18.9	17.51	16.63	18.9	11.27	61.19	18.9	44.42	31.95	19.0	15.40	33.92	19.1	48.71	16.58
19.9	17.60	16.36	19.9	11.30	60.88	19.9	44.46	31.62	20.0	15.34	33.58	20.1	48.66	16.26
20.9	17.71	16.07	20.9	11.32	60.54	20.9	44.52	31.29	21.0	15.27	33.28	21.1	48.64	15.94
21.9	17.83	15.76	21.9	11.34	60.20	21.9	44.60	30.94	22.0	15.21	32.99	22.1	48.62	15.60
22.9	17.97	15.49	22.9	11.32	59.88	22.9	44.69	30.59	23.0	15.14	32.70	23.0	48.61	15.24
23.9	18.12	15.22	23.9	11.29	59.54	23.9	44.81	30.27	24.0	15.06	32.42	24.0	48.60	14.88
24.9	18.29	14.99	24.9	11.26	59.18	24.9	44.94	29.97	25.0	14.99	32.11	25.0	48.62	14.55
25.9	18.45	14.78	25.9	11.25	58.81	25.9	45.07	29.69	26.0	14.91	31.78	26.0	48.65	14.25
26.9	18.60	14.59	26.9	11.27	58.41	26.9	45.20	29.44	27.0	14.84	31.42	27.0	48.67	13.95
27.9	18.76	14.42	27.9	11.31	58.01	27.9	45.32	29.22	28.0	14.77	31.03	28.0	48.70	13.69
28.9	18.90	14.25	28.9	11.41	57.61	28.9	45.43	28.98	29.0	14.72	30.62	29.0	48.72	13.43
29.9	19.02	14.06	29.9	11.55	57.22	29.9	45.54	28.73	30.0	14.68	30.22	30.0	48.73	13.17
30.9	19.15	13.86	30.9	11.71	56.85	30.9	45.62	28.47	31.0	14.64	29.84	31.0	48.73	12.91
31.9	19.27	13.64	31.9	11.89	56.50	31.9	45.70	28.21	32.0	14.62	29.49	32.0	48.72	12.61
	8.56	−8.50		23.40	+23.38		9.88	−9.83		7.35	+7.28		6.25	−6.17
14h 13m 18s.531			15h 4m 0s.607			15h 23m 43s.237			16h 54m 31s.741			17h 15m 43s.730		
−83° 17′ 4″.27			+87° 33′ 24″.43			−84° 11′ 17″.84			+82° 10′ 38″.40			−80° 47′ 2″.69		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Ursæ Minoris.			χ Octantis.			λ Ursæ Minoris.			σ Octantis.			76 Draconis.		
Mag. 4.4			Mag. 5.2			Mag. 6.6			Mag. 5.5			Mag. 5.7		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Nov.	17 58	+86 36	Nov.	18 5	−87 40	Nov.	19 1	+89 1	Nov.	19 26	−89 13	Nov.	20 48	+82 13
	s	″		s	″		s	″		s	″		s	″
1.1	44.25	62.20	1.1	55.99	10.19	1.2	53.50	16.76	1.2	88.49	49.43	1.3	38.81	48.87
2.1	43.87	61.96	2.1	55.66	10.01	2.2	51.98	16.63	2.2	87.22	49.32	2.3	38.62	48.91
3.1	43.52	61.72	3.1	55.30	9.82	3.2	50.55	16.49	3.2	85.85	49.24	3.2	38.43	48.94
4.1	43.20	61.48	4.1	54.90	9.62	4.2	49.20	16.37	4.2	84.36	49.12	4.2	38.26	48.96
5.1	42.88	61.27	5.1	54.48	9.40	5.2	47.93	16.23	5.2	82.79	48.99	5.2	38.09	48.98
6.1	42.58	61.07	6.1	54.07	9.15	6.2	46.72	16.12	6.2	81.19	48.83	6.2	37.93	49.01
7.1	42.27	60.89	7.1	53.68	8.87	7.2	45.48	16.03	7.2	79.60	48.65	7.2	37.78	49.06
8.1	41.96	60.71	8.1	53.33	8.57	8.2	44.23	15.93	8.2	78.07	48.45	8.2	37.62	49.10
9.1	41.62	60.54	9.1	53.02	8.26	9.2	42.92	15.84	9.2	76.65	48.22	9.2	37.46	49.17
10.1	41.27	60.36	10.1	52.75	7.96	10.2	41.56	15.75	10.2	75.34	48.01	10.2	37.29	49.25
11.1	40.92	60.15	11.1	52.50	7.66	11.2	40.15	15.65	11.2	74.11	47.79	11.2	37.12	49.31
12.1	40.57	59.92	12.1	52.27	7.41	12.2	38.71	15.52	12.2	72.98	47.58	12.2	36.95	49.35
13.1	40.23	59.68	13.1	52.05	7.15	13.1	37.27	15.38	13.2	71.86	47.40	13.2	36.77	49.38
14.1	39.89	59.41	14.1	51.84	6.90	14.1	35.86	15.21	14.2	70.76	47.23	14.2	36.59	49.38
15.1	39.58	59.14	15.1	51.60	6.66	15.1	34.50	15.03	15.2	69.64	47.02	15.2	36.40	49.35
16.1	39.28	58.85	16.1	51.35	6.41	16.1	33.19	14.85	16.2	68.48	46.83	16.2	36.22	49.32
17.1	38.99	58.56	17.1	51.09	6.16	17.1	31.95	14.65	17.2	67.27	46.68	17.2	36.04	49.26
18.1	38.73	58.27	18.1	50.81	5.90	18.1	30.77	14.46	18.2	66.02	46.48	18.2	35.87	49.19
19.1	38.49	57.99	19.1	50.52	5.64	19.1	29.64	14.26	19.1	64.72	46.27	19.2	35.71	49.13
20.1	38.25	57.75	20.1	50.24	5.34	20.1	28.56	14.08	20.1	63.41	46.05	20.2	35.55	49.07
21.1	38.00	57.50	21.1	49.97	5.02	21.1	27.50	13.89	21.1	62.09	45.81	21.2	35.41	49.02
22.1	37.76	57.28	22.1	49.73	4.68	22.1	26.43	13.72	22.1	60.82	45.54	22.2	35.25	49.01
23.1	37.50	57.05	23.1	49.54	4.34	23.1	25.33	13.57	23.1	59.64	45.25	23.2	35.09	48.98
24.1	37.23	56.84	24.1	49.38	3.98	24.1	24.17	13.42	24.1	58.58	44.95	24.2	34.94	48.97
25.1	36.95	56.59	25.1	49.28	3.64	25.1	22.94	13.25	25.1	57.66	44.65	25.2	34.77	48.94
26.1	36.66	56.31	26.1	49.21	3.31	26.1	21.66	13.08	26.1	56.85	44.35	26.2	34.61	48.91
27.1	36.37	56.03	27.1	49.16	3.00	27.1	20.34	12.86	27.1	56.15	44.06	27.2	34.44	48.87
28.1	36.10	55.71	28.1	49.11	2.71	28.1	19.06	12.64	28.1	55.47	43.81	28.2	34.26	48.80
29.1	35.85	55.36	29.1	49.03	2.43	29.1	17.85	12.41	29.1	54.75	43.57	29.2	34.08	48.72
30.1	35.61	55.02	30.1	48.93	2.16	30.1	16.71	12.14	30.1	53.96	43.34	30.2	33.90	48.59
31.1	35.42	54.68	31.1	48.80	1.89	31.1	15.69	11.87	31.1	53.07	43.09	31.2	33.73	48.44
32.0	35.24	54.36	32.1	48.65	1.59	32.1	14.77	11.59	32.1	52.11	42.83	32.2	33.58	48.29
16.94 +16.91			24.58 −24.56			58.52 +58.51			74.39 −74.38			7.40 +7.33		
17^{h} 59^{m} 20^{s}.805			18^{h} 5^{m} 36^{s}.163			19^{h} 3^{m} 51^{s}.560			19^{h} 26^{m} 7^{s}.189			20^{h} 48^{m} 44^{s}.660		
+86° 36′ 51″.19			−87° 39′ 52″.21			+89° 0′ 56″.70			−89° 13′ 35″.99			+82° 13′ 16″.38		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			**υ Octantis.** Mag. 5.7			**β Octantis.** Mag. 4.3			**39 H. Cephei.** Mag. 5.6			**γ¹ Octantis.** Mag. 5.1		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Nov.	21 38	−83 6	Nov.	22 16	−86 23	Nov.	22 37	−81 49	Nov.	23 27	+86 51	Nov.	23 47	−82 28
	s	″		s	″		s	″		s	″		s	″
1.3	24.84	25.26	1.3	21.65	44.15	1.3	45.71	17.55	1.4	54.76	16.04	1.4	25.82	58.96
2.3	24.70	25.33	2.3	21.39	44.24	2.3	45.60	17.69	2.4	54.43	16.35	2.4	25.73	59.17
3.3	24.55	25.41	3.3	21.12	44.37	3.3	45.47	17.85	3.4	54.10	16.62	3.4	25.63	59.40
4.3	24.37	25.49	4.3	20.81	44.51	4.3	45.35	17.99	4.4	53.78	16.86	4.4	25.52	59.64
5.3	24.19	25.58	5.3	20.47	44.63	5.3	45.21	18.15	5.4	53.49	17.10	5.4	25.40	59.89
6.3	23.99	25.64	6.3	20.10	44.75	6.3	45.06	18.29	6.4	53.22	17.34	6.4	25.25	60.11
7.3	23.79	25.63	7.3	19.73	44.83	7.3	44.89	18.42	7.3	52.97	17.59	7.4	25.11	60.34
8.3	23.59	25.67	8.3	19.34	44.89	8.3	44.74	18.52	8.3	52.73	17.85	8.4	24.96	60.53
9.3	23.40	25.65	9.3	18.97	44.93	9.3	44.58	18.60	9.3	52.49	18.13	9.4	24.80	60.71
10.3	23.22	25.62	10.3	18.62	44.94	10.3	44.43	18.65	10.3	52.22	18.41	10.4	24.65	60.86
11.3	23.06	25.57	11.3	18.27	44.96	11.3	44.28	18.70	11.3	51.94	18.70	11.4	24.51	61.01
12.3	22.90	25.53	12.3	17.95	44.95	12.3	44.15	18.74	12.3	51.63	18.97	12.4	24.37	61.15
13.3	22.75	25.50	13.3	17.65	44.97	13.3	44.02	18.79	13.3	51.31	19.24	13.3	24.24	61.29
14.3	22.59	25.50	14.3	17.36	45.01	14.3	43.89	18.85	14.3	50.97	19.50	14.3	24.12	61.42
15.3	22.44	25.48	15.3	17.05	45.04	15.3	43.77	18.90	15.3	50.60	19.74	15.3	24.00	61.57
16.2	22.29	25.46	16.3	16.74	45.08	16.3	43.65	18.97	16.3	50.23	19.97	16.3	23.88	61.72
17.2	22.12	25.46	17.3	16.43	45.11	17.3	43.51	19.05	17.3	49.85	20.17	17.3	23.74	61.88
18.2	21.95	25.46	18.3	16.10	45.13	18.3	43.37	19.12	18.3	49.49	20.36	18.3	23.60	62.05
19.2	21.77	25.44	19.3	15.75	45.16	19.3	43.23	19.18	19.3	49.15	20.55	19.3	23.47	62.21
20.2	21.58	25.40	20.3	15.38	45.19	20.3	43.07	19.25	20.3	48.81	20.72	20.3	23.31	62.37
21.2	21.40	25.35	21.3	15.01	45.20	21.3	42.90	19.30	21.3	48.48	20.90	21.3	23.13	62.52
22.2	21.20	25.27	22.3	14.62	45.17	22.3	42.73	19.31	22.3	48.18	21.08	22.3	22.96	62.66
23.2	21.01	25.17	23.3	14.23	45.12	23.3	42.57	19.30	23.3	47.90	21.28	23.3	22.79	62.76
24.2	20.83	25.04	24.3	13.86	45.03	24.3	42.41	19.28	24.3	47.59	21.51	24.3	22.61	62.83
25.2	20.67	24.90	25.2	13.52	44.94	25.3	42.26	19.23	25.3	47.27	21.73	25.3	22.45	62.89
26.2	20.53	24.76	26.2	13.19	44.85	26.3	42.12	19.17	26.3	46.93	21.95	26.3	22.31	62.94
27.2	20.38	24.63	27.2	12.91	44.74	27.3	42.00	19.11	27.3	46.55	22.17	27.3	22.16	62.96
28.2	20.25	24.50	28.2	12.62	44.67	28.3	41.88	19.06	28.3	46.15	22.37	28.3	22.02	63.03
29.2	20.13	24.40	29.2	12.34	44.60	29.3	41.77	19.03	29.3	45.73	22.56	29.3	21.90	63.07
30.2	19.99	24.29	30.2	12.06	44.54	30.3	41.64	19.01	30.3	45.30	22.71	30.3	21.76	63.13
31.2	19.85	24.22	31.2	11.75	44.49	31.2	41.51	19.01	31.3	44.88	22.83	31.3	21.62	63.21
32.2	19.68	24.14	32.2	11.43	44.44	32.2	41.37	19.00	32.3	44.49	22.93	32.3	21.46	63.30
	8.33	−8.27		15.91	−15.88		7.03	−6.96		18.23	+18.20		7.04	−7.58
21^h	38^m	$10^s.025$	22^h	15^m	$56^s.333$	22^h	37^m	$32^s.703$	23^h	27^m	$44^s.392$	23^h	47^m	$12^s.813$
−83°	6′	23″.31	−86°	23′	45″.22	−81°	49′	21″.11	+86°	50′	39″.03	−82°	29′	8″.43

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			*α* **Ursæ Minoris.** (*Polaris.*) Mag. 2.1			**4 G. Octantis.** Mag. 5.6			**Groombridge 750.** Mag. 6.7			**Groombridge 944.** Mag. 6.4		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Dec.	0 57	+85 49	Dec.	1 30	+88 52	Dec.	1 42	−85 11	Dec.	4 10	+85 20	Dec.	5 35	+85 9
	s	″		s	″		s	″		s	″		s	″
0.3	18.54	7.22	0.4	55.64	3.75	0.4	15.23	30.12	0.5	21.65	18.11	0.5	32.14	29.37
1.3	18.30	7.45	1.4	54.85	4.05	1.4	15.05	30.34	1.5	21.66	18.45	1.5	32.25	29.71
2.3	18.06	7.67	2.4	54.09	4.32	2.4	14.86	30.57	2.5	21.66	18.79	2.5	32.35	30.02
3.3	17.84	7.87	3.4	53.39	4.55	3.4	14.65	30.81	3.5	21.66	19.11	3.5	32.47	30.31
4.3	17.65	8.06	4.4	52.76	4.78	4.4	14.42	31.05	4.5	21.67	19.39	4.5	32.55	30.58
5.3	17.46	8.27	5.4	52.18	5.04	5.4	14.19	31.28	5.5	21.70	19.69	5.5	32.65	30.83
6.3	17.28	8.50	6.4	51.61	5.28	6.4	13.93	31.48	6.5	21.74	19.99	6.5	32.78	31.09
7.3	17.10	8.73	7.3	51.05	5.56	7.4	13.66	31.66	7.5	21.78	20.30	7.5	32.90	31.36
8.3	16.92	8.97	8.3	50.44	5.83	8.4	13.42	31.80	8.5	21.83	20.61	8.5	33.05	31.66
9.3	16.72	9.21	9.3	49.77	6.10	9.4	13.17	31.93	9.5	21.87	20.95	9.5	33.19	31.97
10.3	16.49	9.44	10.3	49.04	6.39	10.4	12.94	32.08	10.5	21.89	21.30	10.5	33.32	32.28
11.3	16.25	9.66	11.3	48.22	6.67	11.3	12.72	32.18	11.5	21.90	21.65	11.5	33.43	32.62
12.3	15.98	9.87	12.3	47.35	6.91	12.3	12.50	32.31	12.4	21.89	22.01	12.5	33.53	32.97
13.3	15.71	10.08	13.3	46.43	7.16	13.3	12.29	32.44	13.4	21.85	22.37	13.5	33.62	33.31
14.3	15.43	10.28	14.3	45.49	7.39	14.3	12.08	32.58	14.4	21.81	22.73	14.5	33.67	33.66
15.3	15.15	10.45	15.3	44.54	7.62	15.3	11.85	32.72	15.4	21.75	23.06	15.5	33.72	34.00
16.3	14.88	10.60	16.3	43.60	7.82	16.3	11.62	32.86	16.4	21.70	23.39	16.5	33.76	34.34
17.3	14.62	10.73	17.3	42.69	8.01	17.3	11.38	33.02	17.4	21.63	23.68	17.5	33.79	34.65
18.3	14.37	10.84	18.3	41.82	8.18	18.3	11.13	33.17	18.4	21.56	23.97	18.5	33.82	34.92
19.3	14.13	10.97	19.3	41.01	8.35	19.3	10.86	33.31	19.4	21.51	24.25	19.5	33.86	35.23
20.3	13.91	11.11	20.3	40.24	8.51	20.3	10.57	33.42	20.4	21.47	24.53	20.5	33.90	35.50
21.3	13.69	11.25	21.3	39.50	8.70	21.3	10.27	33.53	21.4	21.44	24.80	21.5	33.96	35.77
22.3	13.47	11.41	22.3	38.76	8.92	22.3	9.98	33.60	22.4	21.43	25.09	22.5	34.04	36.05
23.3	13.25	11.59	23.3	37.96	9.14	23.3	9.70	33.66	23.4	21.42	25.40	23.5	34.13	36.37
24.3	13.01	11.77	24.3	37.10	9.37	24.3	9.43	33.70	24.4	21.38	25.75	24.5	34.20	36.70
25.3	12.73	11.93	25.3	36.14	9.62	25.3	9.18	33.70	25.4	21.34	26.09	25.5	34.26	37.06
26.3	12.44	12.09	26.3	35.10	9.83	26.3	8.94	33.72	26.4	21.26	26.44	26.5	34.31	37.43
27.3	12.13	12.23	27.3	34.00	10.02	27.3	8.70	33.76	27.4	21.17	26.79	27.5	34.33	37.80
28.3	11.81	12.33	28.3	32.88	10.17	28.3	8.47	33.80	28.4	21.05	27.11	28.5	34.32	38.15
29.3	11.50	12.40	29.3	31.78	10.30	29.3	8.23	33.85	29.4	20.92	27.41	29.5	34.28	38.48
30.3	11.21	12.45	30.3	30.70	10.40	30.3	7.96	33.94	30.4	20.79	27.67	30.5	34.24	38.80
31.3	10.94	12.49	31.3	29.73	10.50	31.3	7.69	34.01	31.4	20.66	27.91	31.5	34.20	39.06
13.72		+13.68	50.65		+50.64	11.93		−11.89	12.31		+12.27	11.85		+11.81
0^h 57^m $1^s.657$			1^h 29^m $44^s.254$			1^h 42^m $6^s.102$			4^h 9^m $44^s.952$			5^h 34^m $54^s.014$		
+85° 48′ 25″.87			+88° 51′ 25″.03			−85° 11′ 39″.58			+85° 20′ 1″.04			+85° 9′ 28″.07		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Mensæ. Mag. 6.2			ζ Mensæ. Mag. 5.6			51 H. Cephei. Mag. 5.3			25 H. Camelop. Mag. 5.1			7 G. Octa Mag. 6.	
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m
Dec.	5 46	−84 49	Dec.	6 47	−80 43	Dec.	7 2	+87 10	Dec.	7 13	+82 34	Dec.	7 16
	s	″		s	″		s	″		s	″		s
0.5	26.75	37.60	0.6	4.37	25.09	0.6	33.98	45.09	0.6	53.80	19.78	0.6	34.13
1.5	26.81	37.91	1.6	4.43	25.37	1.6	34.33	45.35	1.6	53.94	20.03	1.6	34.35
2.5	26.87	38.23	2.6	4.50	25.68	2.6	34.65	45.60	2.6	54.08	20.24	2.6	34.58
3.5	26.93	38.59	3.6	4.57	26.01	3.6	34.94	45.83	3.6	54.21	20.44	3.6	34.83
4.5	26.97	38.97	4.6	4.64	26.39	4.6	35.23	46.03	4.6	54.32	20.63	4.6	35.07
5.5	27.00	39.36	5.6	4.70	26.77	5.6	35.55	46.23	5.6	54.44	20.81	5.6	35.28
6.5	27.01	39.76	6.6	4.76	27.14	6.6	35.88	46.42	6.6	54.59	20.99	6.6	35.47
7.5	27.01	40.15	7.6	4.81	27.53	7.6	36.23	46.61	7.6	54.73	21.17	7.6	35.65
8.5	27.00	40.52	8.6	4.84	27.90	8.6	36.59	46.83	8.6	54.88	21.35	8.6	35.79
9.5	26.98	40.89	9.6	4.89	28.27	9.6	36.96	47.06	9.6	55.04	21.56	9.6	35.91
10.5	26.96	41.23	10.6	4.92	28.62	10.6	37.31	47.33	10.6	55.19	21.79	10.6	36.02
11.5	26.93	41.56	11.6	4.94	28.95	11.6	37.67	47.59	11.6	55.34	22.02	11.6	36.14
12.5	26.91	41.87	12.6	4.97	29.29	12.6	38.01	47.88	12.6	55.48	22.29	12.6	36.24
13.5	26.90	42.17	13.6	5.00	29.61	13.6	38.30	48.17	13.6	55.62	22.57	13.6	36.35
14.5	26.89	42.49	14.6	5.03	29.93	14.6	38.58	48.48	14.6	55.73	22.84	14.6	36.48
15.5	26.87	42.81	15.5	5.07	30.27	15.6	38.82	48.79	15.6	55.83	23.12	15.6	36.61
16.5	26.87	43.14	16.5	5.09	30.60	16.6	39.06	49.08	16.6	55.93	23.39	16.6	36.74
17.5	26.85	43.51	17.5	5.12	30.97	17.6	39.25	49.36	17.6	56.02	23.64	17.6	36.88
18.5	26.82	43.88	18.5	5.15	31.33	18.6	39.45	49.62	18.6	56.11	23.88	18.6	37.01
19.5	26.79	44.26	19.5	5.18	31.73	19.5	39.66	49.87	19.6	56.20	24.12	19.6	37.12
20.5	26.75	44.65	20.5	5.19	32.14	20.5	39.88	50.11	20.6	56.28	24.35	20.6	37.22
21.5	26.67	45.04	21.5	5.21	32.56	21.5	40.12	50.35	21.6	56.39	24.56	21.6	37.28
22.5	26.59	45.41	22.5	5.22	32.97	22.5	40.38	50.58	22.5	56.52	24.77	22.6	37.32
23.5	26.50	45.77	23.5	5.21	33.36	23.5	40.66	50.85	23.5	56.64	25.01	23.5	37.32
24.5	26.40	46.11	24.5	5.20	33.73	24.5	40.95	51.15	24.5	56.77	25.27	24.5	37.32
25.5	26.30	46.41	25.5	5.19	34.08	25.5	41.22	51.45	25.5	56.89	25.55	25.5	37.28
26.5	26.20	46.70	26.5	5.17	34.41	26.5	41.46	51.79	26.5	57.00	25.88	26.5	37.27
27.5	26.11	46.99	27.5	5.16	34.75	27.5	41.66	52.13	27.5	57.10	26.20	27.5	37.27
28.5	26.03	47.30	28.5	5.15	35.06	28.5	41.83	52.48	28.5	57.18	26.53	28.5	37.27
29.5	25.96	47.61	29.5	5.15	35.39	29.5	41.95	52.82	29.5	57.23	26.84	29.5	37.30
30.5	25.88	47.95	30.5	5.15	35.76	30.5	42.05	53.14	30.5	57.29	27.14	30.5	37.34
31.5	25.81	48.31	31.5	5.15	36.15	31.5	42.13	53.42	31.5	57.32	27.41	31.5	37.37
11.08 −11.04			6.20 −6.12			20.33 +20.30			7.74 +7.67			18.49 −1	
5h 46m 26s.439			6h 47m 3s.489			7h 1m 34s.861			7h 13m 29s.477			7h 16m 4	
−84° 49′ 48″.17			−80° 43′ 34″.16			+87° 11′ 0″.11			+82° 34′ 36″.50			−86° 54′	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			**ζ Octantis.** Mag. 5.4			**1 H. Draconis.** Mag. 4.6			**ζ Chamæleontis.** Mag. 5.2			**30 H. Camelop.** Mag. 5.3		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Dec.	8 16	+88 52	Dec.	9 9	−85 19	Dec.	9 25	+81 41	Dec.	9 36	−80 33	Dec.	10 21	+82 58
	s	″		s	″		s	″		s	″		s	″
0.7	48.42	44.23	0.7	0.86	39.71	0.7	27.82	21.56	0.7	23.29	48.85	0.7	9.06	31.78
1.6	49.52	44.40	1.7	1.09	39.86	1.7	28.00	21.60	1.7	23.42	48.99	1.7	9.26	31.73
2.6	50.53	44.55	2.7	1.33	40.03	2.7	28.15	21.65	2.7	23.55	49.13	2.7	9.45	31.70
3.6	51.49	44.70	3.7	1.61	40.20	3.7	28.30	21.69	3.7	23.69	49.29	3.7	9.63	31.67
4.6	52.42	44.83	4.7	1.87	40.42	4.7	28.44	21.72	4.7	23.83	49.46	4.7	9.81	31.64
5.6	53.38	44.94	5.7	2.13	40.65	5.7	28.59	21.73	5.7	23.98	49.67	5.7	9.98	31.59
6.6	54.35	45.06	6.7	2.38	40.93	6.7	28.74	21.72	6.7	24.12	49.90	6.7	10.15	31.53
7.6	55.40	45.17	7.7	2.63	41.19	7.7	28.92	21.73	7.7	24.26	50.14	7.7	10.34	31.45
8.6	56.50	45.29	8.7	2.85	41.46	8.7	29.09	21.73	8.7	24.40	50.38	8.7	10.53	31.38
9.6	57.61	45.44	9.7	3.05	41.72	9.7	29.26	21.76	9.7	24.51	50.62	9.7	10.74	31.33
10.6	58.74	45.61	10.7	3.25	41.98	10.7	29.44	21.80	10.7	24.62	50.86	10.7	10.96	31.30
11.6	59.86	45.79	11.7	3.44	42.22	11.7	29.63	21.86	11.7	24.74	51.10	11.7	11.18	31.28
12.6	60.95	45.98	12.7	3.62	42.44	12.7	29.80	21.94	12.7	24.85	51.33	12.7	11.40	31.26
13.6	61.99	46.21	13.7	3.80	42.68	13.7	29.97	22.05	13.7	24.96	51.53	13.7	11.61	31.27
14.6	62.96	46.44	14.6	3.99	42.90	14.7	30.13	22.19	14.7	25.07	51.74	14.7	11.81	31.31
15.6	63.87	46.67	15.6	4.18	43.14	15.7	30.29	22.31	15.7	25.17	51.96	15.7	12.02	31.36
16.6	64.72	46.90	16.6	4.38	43.38	16.7	30.44	22.43	16.7	25.29	52.18	16.7	12.20	31.42
17.6	65.51	47.13	17.6	4.61	43.63	17.7	30.58	22.56	17.7	25.40	52.40	17.7	12.38	31.48
18.6	66.27	47.34	18.6	4.81	43.90	18.6	30.72	22.68	18.7	25.53	52.64	18.7	12.55	31.53
19.6	67.02	47.54	19.6	5.02	44.19	19.6	30.85	22.78	19.7	25.65	52.92	19.7	12.72	31.57
20.6	67.80	47.72	20.6	5.23	44.51	20.6	30.98	22.87	20.7	25.77	53.21	20.7	12.88	31.59
21.6	68.62	47.92	21.6	5.43	44.86	21.6	31.13	22.92	21.6	25.89	53.53	21.7	13.06	31.60
22.6	69.50	48.10	22.6	5.61	45.19	22.6	31.28	23.00	22.6	26.00	53.86	22.7	13.24	31.61
23.6	70.45	48.29	23.6	5.76	45.56	23.6	31.44	23.11	23.6	26.11	54.19	23.7	13.44	31.62
24.6	71.43	48.50	24.6	5.90	45.89	24.6	31.62	23.21	24.6	26.21	54.52	24.7	13.65	31.63
25.6	72.41	48.73	25.6	6.02	46.22	25.6	31.79	23.34	25.6	26.30	54.84	25.7	13.87	31.67
26.6	73.33	49.00	26.6	6.14	46.51	26.6	31.97	23.48	26.6	26.38	55.14	26.7	14.09	31.74
27.6	74.19	49.28	27.6	6.26	46.81	27.6	32.12	23.67	27.6	26.45	55.42	27.7	14.29	31.84
28.6	74.94	49.57	28.6	6.39	47.10	28.6	32.26	23.87	28.6	26.54	55.69	28.7	14.48	31.98
29.6	75.59	49.85	29.6	6.53	47.37	29.6	32.39	24.07	29.6	26.62	55.97	29.7	14.66	32.12
30.6	76.16	50.13	30.6	6.68	47.68	30.6	32.50	24.27	30.6	26.72	56.27	30.7	14.81	32.25
31.6	76.68	50.38	31.6	6.86	47.99	31.6	32.61	24.46	31.6	26.82	56.57	31.7	14.97	32.37
	51.14	+51.13		12.28	−12.24		6.92	+6.85		6.10	−6.02		8.18	+8.12
	$8^{h}\ 14^{m}\ 48^{s}.311$			$9^{h}\ 9^{m}\ 6^{s}.085$			$9^{h}\ 25^{m}\ 12^{s}.930$			$9^{h}\ 36^{m}\ 24^{s}.003$			$10^{h}\ 20^{m}\ 57^{s}.259$	
	+88° 53′ 11″.43			−85° 19′ 42″.77			+81° 41′ 57″.18			−80° 33′ 50″.61			+82° 59′ 12″.27	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

η Octantis. Mag. 6.3			**Bradley 1672.** Mag. 6.3			**ι Octantis.** Mag. 5.4			**32 H. Camelop.** ***seq.*** Mag. 5.3			**κ Octantis.** Mag. 5.6		
Wash. Mean Time.	**Right Ascension.**	**Declination.**	**Wash. Mean Time.**	**Right Ascension.**	**Declination.**	**Wash. Mean Time.**	**Right Ascension.**	**Declination.**	**Wash. Mean Time.**	**Right Ascension.**	**Declination.**	**Wash. Mean Time.**	**Right Ascension.**	**Declination.**
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Dec.	10 59	−84 8	Dec.	12 14	+88 9	Dec.	12 45	−84 40	Dec.	12 48	+83 51	Dec.	13 27	−85 21
	s	″		s	″		s	″		s	″		s	″
0.8	52.22	33.60	0.8	18.66	13.00	0.8	58.76	9.66	0.8	25.85	28.66	0.9	3.23	32.00
1.8	52.43	33.61	1.8	19.31	12.81	1.8	58.97	9.52	1.8	26.03	28.42	1.9	3.45	31.82
2.8	52.65	33.62	2.8	19.92	12.63	2.8	59.19	9.38	2.8	26.20	28.22	2.9	3.67	31.65
3.8	52.89	33.65	3.8	20.49	12.46	3.8	59.43	9.25	3.8	26.35	28.00	3.9	3.92	31.45
4.8	53.14	33.69	4.8	21.01	12.30	4.8	59.69	9.11	4.8	26.50	27.78	4.9	4.19	31.25
5.8	53.41	33.76	5.8	21.53	12.12	5.8	59.96	9.02	5.8	26.64	27.55	5.9	4.48	31.08
6.8	53.67	33.85	6.8	22.03	11.92	6.8	60.24	8.94	6.8	26.78	27.31	6.9	4.77	30.94
7.7	53.91	33.97	7.8	22.58	11.72	7.8	60.52	8.89	7.8	26.94	27.05	7.8	5.08	30.83
8.7	54.16	34.10	8.8	23.16	11.51	8.8	60.79	8.84	8.8	27.11	26.80	8.8	5.37	30.72
9.7	54.38	34.23	9.8	23.79	11.28	9.8	61.04	8.81	9.8	27.29	26.55	9.8	5.66	30.62
10.7	54.60	34.37	10.8	24.45	11.09	10.8	61.29	8.80	10.8	27.48	26.29	10.8	5.94	30.55
11.7	54.80	34.49	11.8	25.15	10.90	11.8	61.54	8.77	11.8	27.68	26.04	11.8	6.20	30.48
12.7	55.00	34.59	12.8	25.87	10.74	12.8	61.77	8.72	12.8	27.88	25.82	12.8	6.45	30.38
13.7	55.22	34.70	13.8	26.59	10.58	13.8	62.00	8.71	13.8	28.09	25.61	13.8	6.70	30.29
14.7	55.40	34.80	14.8	27.31	10.45	14.8	62.22	8.67	14.8	28.30	25.42	14.8	6.94	30.21
15.7	55.61	34.90	15.8	28.02	10.35	15.8	62.45	8.63	15.8	28.51	25.26	15.8	7.20	30.10
16.7	55.83	35.01	16.8	28.70	10.25	16.8	62.69	8.59	16.8	28.71	25.10	16.8	7.46	30.00
17.7	56.06	35.12	17.8	29.35	10.17	17.8	62.95	8.55	17.8	28.89	24.96	17.8	7.74	29.89
18.7	56.29	35.25	18.8	29.96	10.08	18.8	63.22	8.49	18.8	29.08	24.82	18.8	8.03	29.78
19.7	56.52	35.40	19.8	30.55	9.98	19.8	63.49	8.49	19.8	29.26	24.68	19.8	8.34	29.68
20.7	56.77	35.58	20.8	31.12	9.88	20.8	63.78	8.49	20.8	29.42	24.51	20.8	8.67	29.61
21.7	57.00	35.78	21.8	31.71	9.74	21.8	64.09	8.52	21.8	29.59	24.34	21.8	9.01	29.57
22.7	57.24	36.01	22.8	32.33	9.62	22.8	64.38	8.57	22.8	29.77	24.17	22.8	9.35	29.56
23.7	57.46	36.24	23.8	32.98	9.49	23.8	64.66	8.66	23.8	29.98	23.98	23.8	9.68	29.57
24.7	57.66	36.47	24.8	33.68	9.36	24.8	64.94	8.75	24.8	30.18	23.78	24.8	9.98	29.60
25.7	57.85	36.71	25.8	34.44	9.25	25.8	65.18	8.84	25.8	30.41	23.60	25.8	10.27	29.63
26.7	58.02	36.92	26.7	35.22	9.18	26.8	65.42	8.92	26.8	30.65	23.45	26.8	10.56	29.66
27.7	58.20	37.12	27.7	36.01	9.09	27.8	65.65	8.99	27.8	30.89	23.34	27.8	10.81	29.67
28.7	58.37	37.30	28.7	36.77	9.06	28.8	65.88	9.03	28.8	31.12	23.24	28.8	11.08	29.65
29.7	58.56	37.47	29.7	37.49	9.04	29.8	66.11	9.07	29.8	31.32	23.15	29.8	11.35	29.64
30.7	58.76	37.66	30.7	38.16	9.03	30.8	66.38	9.12	30.8	31.53	23.09	30.8	11.63	29.60
31.7	58.98	37.88	31.7	38.79	9.03	31.8	66.64	9.16	31.8	31.72	23.04	31.8	11.96	29.57
	9.80	−9.75		31.02	+31.01		10.76	−10.72		9.35	+9.29		12.36	−12.32
10^h	59^m	$55^s.642$	12^h	14^m	$28^s.053$	12^h	46^m	$1^s.183$	12^h	48^m	$29^s.976$	13^h	27^m	$5^s.514$
−84°	8′	31″.24	+88°	9′	56″.03	−84°	40′	2″.72	+83°	52′	10″.05	−85°	21′	23″.59

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			**Groombridge 2283.** Mag. 7.2			**ρ Octantis.** Mag. 5.7			**ε Ursæ Minoris.** Mag. 4.4			**59 G. Apodis.** Mag. 5.9		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Dec.	14 13	−83 17	Dec.	15 3	+87 32	Dec.	15 23	−84 11	Dec.	16 54	+82 10	Dec.	17 15	−80 47
	s	″		s	″		s	″		s	″		s	″
0.9	19.15	13.86	0.9	11.71	56.85	0.9	45.62	28.47	1.0	14.64	29.84	1.0	48.73	12.91
1.9	19.27	13.64	1.9	11.89	56.50	1.9	45.70	28.21	2.0	14.62	29.49	2.0	48.72	12.61
2.9	19.40	13.40	2.9	12.04	56.18	2.9	45.79	27.92	3.0	14.60	29.15	3.0	48.71	12.29
3.9	19.54	13.15	3.9	12.20	55.88	3.9	45.91	27.61	4.0	14.57	28.82	4.0	48.71	11.94
4.9	19.71	12.91	4.9	12.31	55.58	4.9	46.03	27.29	4.9	14.54	28.51	5.0	48.73	11.58
5.9	19.88	12.69	5.9	12.42	55.27	5.9	46.18	26.97	5.9	14.51	28.20	6.0	48.75	11.22
6.9	20.07	12.49	6.9	12.52	54.96	6.9	46.35	23.68	6.9	14.47	27.88	7.0	48.79	10.87
7.9	20.27	12.31	7.9	12.61	54.63	7.9	46.52	26.40	7.9	14.44	27.56	8.0	48.83	10.54
8.9	20.46	12.15	8.9	12.73	54.28	8.9	46.70	26.14	8.9	14.41	27.22	9.0	48.88	10.22
9.9	20.65	12.01	9.9	12.85	53.92	9.9	46.87	25.92	9.9	14.39	26.86	9.9	48.94	9.93
10.9	20.83	11.86	10.9	13.05	53.55	10.9	47.04	25.70	10.9	14.37	26.48	10.9	48.99	9.65
11.9	21.00	11.73	11.9	13.27	53.19	11.9	47.20	25.50	11.9	14.36	26.08	11.9	49.04	9.38
12.9	21.16	11.61	12.9	13.51	52.82	12.9	47.35	25.29	12.9	14.35	25.69	12.9	49.10	9.11
13.9	21.32	11.47	13.9	13.77	52.45	13.9	47.50	25.08	13.9	14.36	25.30	13.9	49.14	8.84
14.9	21.48	11.33	14.9	14.05	52.17	14.9	47.63	24.86	14.9	14.37	24.92	14.9	49.17	8.55
15.9	21.65	11.18	15.9	14.33	51.86	15.9	47.77	24.64	15.9	14.39	24.55	15.9	49.20	8.26
16.9	21.82	11.02	16.9	14.62	51.58	16.9	47.91	24.38	16.9	14.40	24.19	16.9	49.24	7.97
17.9	21.99	10.86	17.9	14.90	51.31	17.9	48.08	24.12	17.9	14.42	23.86	17.9	49.28	7.65
18.9	22.18	10.69	18.9	15.15	51.04	18.9	48.25	23.87	18.9	14.44	23.55	18.9	49.32	7.32
19.8	22.38	10.53	19.9	15.39	50.79	19.9	48.43	23.62	19.9	14.45	23.24	19.9	49.38	6.99
20.8	22.60	10.40	20.9	15.61	50.53	20.9	48.65	23.39	20.9	14.46	22.93	20.9	49.46	6.65
21.8	22.82	10.29	21.9	15.82	50.24	21.9	48.87	23.17	21.9	14.47	22.60	21.9	49.55	6.32
22.8	23.05	10.22	22.9	16.04	49.93	22.9	49.10	22.98	22.9	14.49	22.28	22.9	49.63	6.01
23.8	23.28	10.16	23.9	16.29	49.62	23.9	49.33	22.82	23.9	14.49	21.93	23.9	49.73	5.72
24.8	23.50	10.12	24.9	16.56	49.30	24.9	49.57	22.68	24.9	14.52	21.56	24.9	49.84	5.46
25.8	23.70	10.08	25.9	16.86	48.97	25.9	49.78	22.55	25.9	14.55	21.17	25.9	49.94	5.22
26.8	23.89	10.05	26.9	17.22	48.65	26.9	49.98	22.42	26.9	14.58	20.78	26.9	50.02	5.00
27.8	24.08	10.00	27.9	17.61	48.36	27.9	50.16	22.28	27.9	14.62	20.40	27.9	50.10	4.77
28.8	24.26	9.93	28.9	18.00	48.09	28.9	50.34	22.11	28.9	14.68	20.04	28.9	50.17	4.51
29.8	24.44	9.85	29.9	18.39	47.86	29.9	50.53	21.94	29.9	14.74	19.70	29.9	50.24	4.25
30.8	24.63	9.76	30.9	18.77	47.63	30.9	50.72	21.76	30.9	14.80	19.38	30.9	50.31	3.96
31.8	24.85	9.66	31.9	19.12	47.42	31.9	50.93	21.57	31.9	14.86	19.09	31.9	50.39	3.65
8.55		−8.50	23.37		+23.35	9.88		−9.83	7.34		+7.28	6.24		−6.16
14^{h}	13^{m}	$18^{s}.531$	15^{h}	4^{m}	$0^{s}.607$	15^{h}	23^{m}	$43^{s}.237$	16^{h}	54^{m}	$31^{s}.741$	17^{h}	15^{m}	$43^{s}.730$
−83°	17′	4″.27	+87°	33′	24″.43	−84°	11′	17″.84	+82°	10′	38″.40	−80°	47′	2″.69

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Ursæ Minoris. Mag. 4.4			**χ Octantis.** Mag. 5.2			**λ Ursæ Minoris.** Mag. 6.6			**σ Octantis.** Mag. 5.5			**76 Draconis.** Mag. 5.7		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Dec.	17 58	+86 36	Dec.	18 5	−87 39	Dec.	19 0	+89 1	Dec.	19 26	−89 13	Dec.	20 48	+82 13
	s	″		s	″		s	″		s	″		s	″
1.1	35.42	54.68	1.1	48.80	61.89	1.1	75.69	11.87	1.1	53.07	43.09	1.2	33.73	48.44
2.0	35.24.	54.36	2.1	48.65	61.59	2.1	74.77	11.59	2.1	52.11	42.83	2.2	33.58	48.29
3.0	35.07	54.05	3.1	48.49	61.28	3.1	73.92	11.35	3.1	51.09	42.56	3.2	33.43	48.14
4.0	34.92	53.77	4.0	48.35	60.92	4.1	73.10	11.12	4.1	50.07	42.26	4.2	33.29	48.03
5.0	34.75	53.50	5.0	48.24	60.55	5.1	72.26	10.90	5.1	49.13	41.94	5.2	33.16	47.93
6.0	34.59	53.24	6.0	48.18	60.17	6.1	71.39	10.68	6.1	48.29	41.61	6.2	33.03	47.83
7.0	34.40	52.97	7.0	48.16	59.80	7.1	70.46	10.47	7.1	47.54	41.27	7.2	32.89	47.73
8.0	34.21	52.68	8.0	48.17	59.44	8.1	69.49	10.25	8.1	46.92	40.93	8.2	32.74	47.64
9.0	34.02	52.38	9.0	48.21	59.09	9.1	68.51	10.04	9.1	46.41	40.60	9.2	32.59	47.53
10.0	33.83	52.06	10.0	48.26	58.75	10.1	67.51	9.78	10.1	45.95	40.27	10.1	32.43	47.40
11.0	33.65	51.72	11.0	48.31	58.44	11.1	66.55	9.52	11.1	45.53	39.97	11.1	32.28	47.25
12.0	33.49	51.36	12.0	48.36	58.15	12.1	65.63	9.21	12.1	45.11	39.67	12.1	32.13	47.09
13.0	33.34	51.01	13.0	48.40	57.85	13.1	64.78	8.91	13.1	44.65	39.38	13.1	31.98	46.91
14.0	33.23	50.67	14.0	48.42	57.53	14.1	63.99	8.60	14.1	44.17	39.09	14.1	31.83	46.71
15.0	33.13	50.32	15.0	48.42	57.22	15.1	63.27	8.29	15.1	43.63	38.80	15.1	31.68	46.51
16.0	33.05	49.97	16.0	48.42	56.92	16.1	62.64	7.99	16.1	43.07	38.50	16.1	31.55	46.29
17.0	32.98	49.63	17.0	48.41	56.60	17.1	62.05	7.71	17.1	42.47	38.19	17.1	31.42	46.07
18.0	32.92	49.31	18.0	48.42	56.24	18.1	61.50	7.40	18.1	41.90	37.85	18.1	31.30	45.86
19.0	32.86	49.01	19.0	48.47	55.88	19.0	60.97	7.14	19.1	41.34	37.50	19.1	31.19	45.66
20.0	32.79	48.73	20.0	48.54	55.50	20.0	60.41	6.87	20.1	40.88	37.12	20.1	31.09	45.48
20.9	32.72	48.43	21.0	48.68	55.12	21.0	59.82	6.61	21.1	40.52	36.75	21.1	30.97	45.31
21.9	32.64	48.13	22.0	48.82	54.74	22.0	59.17	6.35	22.1	40.32	36.36	22.1	30.85	45.15
22.9	32.55	47.82	22.9	49.00	54.38	23.0	58.47	6.09	23.1	40.25	35.96	23.1	30.73	44.99
23.9	32.46	47.50	23.9	49.25	54.03	24.0	57.72	5.80	24.1	40.30	35.60	24.1	30.60	44.81
24.9	32.36	47.15	24.9	49.49	53.71	25.0	56.98	5.49	25.0	40.41	35.26	25.1	30.47	44.60
25.9	32.26	46.78	25.9	49.73	53.41	26.0	56.30	5.17	26.0	40.52	34.93	26.1	30.34	44.38
26.9	32.20	46.37	26.9	49.94	53.12	27.0	55.71	4.82	27.0	40.58	34.61	27.1	30.20	44.13
27.9	32.15	45.98	27.9	50.11	52.85	28.0	55.22	4.47	28.0	40.55	34.31	28.1	30.08	43.84
28.9	32.14	45.61	28.9	50.25	52.55	29.0	54.86	4.13	29.0	40.43	34.00	29.1	29.97	43.55
29.9	32.16	45.28	29.9	50.39	52.24	30.0	54.59	3.81	30.0	40.25	33.67	30.1	29.87	43.28
30.9	32.20	44.94	30.9	50.53	51.91	31.0	54.37	3.48	31.0	40.04	33.32	31.1	29.77	43.01
31.9	32.24	44.64	31.9	50.69	51.53	32.0	54.17	3.20	32.0	39.88	32.96	32.1	29.69	42.76
	16.93	+16.90		24.55	−24.53		58.41	+58.40		74.17	−74.16		7.40	+7.33
	$17^h\ 59^m\ 20^s.805$			$18^h\ 5^m\ 36^s.163$			$19^h\ 3^m\ 51^s.560$			$19^h\ 26^m\ 7^s.189$			$20^h\ 48^m\ 44^s.660$	
		+86° 36′ 51″.19			−87° 39′ 52″.21			+89° 0′ 56″.70			−89° 13′ 35″.99			+82° 13′ 16″.38

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			**υ Octantis.** Mag. 5.7			**β Octantis.** Mag. 4.3			**39 H. Cephei.** Mag. 5.6			**γ^1 Octantis.** Mag. 5.1		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Dec.	21 38	−83 6	Dec.	22 16	−86 23	Dec.	22 37	−81 49	Dec.	23 27	+86 51	Dec.	23 47	−82 29
	s	″		s	″		s	″		s	″		s	″
1.2	19.85	24.22	1.2	11.75	44.49	1.2	41.51	19.01	1.3	44.88	22.83	1.3	21.62	3.21
2.2	19.68	24.14	2.2	11.43	44.44	2.2	41.37	19.00	2.3	44.49	22.93	2.3	21.46	3.30
3.2	19.50	24.03	3.2	11.06	44.38	3.2	41.21	18.98	3.3	44.12	23.03	3.3	21.29	3.38
4.2	19.32	23.90	4.2	10.69	44.31	4.2	41.05	18.95	4.3	43.77	23.13	4.3	21.11	3.45
5.2	19.14	23.75	5.2	10.32	44.20	5.2	40.88	18.89	5.3	43.44	23.24	5.3	20.93	3.51
6.2	18.97	23.57	6.2	9.96	44.06	6.2	40.72	18.80	6.3	43.12	23.36	6.3	20.74	3.54
7.2	18.81	23.38	7.2	9.60	43.92	7.2	40.56	18.70	7.3	42.79	23.49	7.3	20.56	3.54
8.2	18.66	23.17	8.2	9.26	43.74	8.2	40.41	18.57	8.3	42.44	23.63	8.3	20.38	3.54
9.2	18.53	22.95	9.2	8.95	43.57	9.2	40.28	18.45	9.3	42.06	23.77	9.3	20.22	3.51
10.2	18.39	22.74	10.2	8.67	43.42	10.2	40.15	18.33	10.3	41.67	23.90	10.3	20.08	3.47
11.2	18.27	22.54	11.2	8.38	43.26	11.2	40.03	18.21	11.3	41.26	24.02	11.3	19.93	3.43
12.2	18.16	22.36	12.2	8.11	43.11	12.2	39.91	18.09	12.3	40.83	24.10	12.3	19.79	3.41
13.2	18.04	22.18	13.2	7.86	42.97	13.2	39.79	17.97	13.2	40.40	24.17	13.3	19.64	3.40
14.2	17.92	22.03	14.2	7.59	42.83	14.2	39.66	17.87	14.2	39.97	24.23	14.3	19.50	3.38
15.2	17.79	21.87	15.2	7.29	42.70	15.2	39.54	17.79	15.2	39.54	24.26	15.3	19.35	3.37
16.2	17.64	21.69	16.2	6.98	42.56	16.2	39.41	17.70	16.2	39.12	24.29	16.3	19.19	3.36
17.2	17.50	21.50	17.2	6.67	42.42	17.2	39.26	17.60	17.2	38.73	24.30	17.3	19.01	3.35
18.2	17.36	21.30	18.2	6.35	42.27	18.2	39.11	17.48	18.2	38.36	24.28	18.3	18.84	3.34
19.2	17.20	21.08	19.2	6.01	42.09	19.2	38.96	17.35	19.2	38.01	24.30	19.2	18.66	3.31
20.2	17.05	20.84	20.2	5.67	41.88	20.2	38.82	17.18	20.2	37.67	24.33	20.2	18.47	3.26
21.2	16.91	20.58	21.2	5.35	41.63	21.2	38.67	16.98	21.2	37.32	24.37	21.2	18.29	3.18
22.2	16.78	20.29	22.2	5.06	41.38	22.2	38.53	16.77	22.2	36.98	24.43	22.2	18.12	3.06
23.2	16.68	20.00	23.2	4.80	41.12	23.2	38.41	16.56	23.2	36.61	24.49	23.2	17.95	2.93
24.1	16.60	19.70	24.2	4.56	40.84	24.2	38.31	16.33	24.2	36.21	24.55	24.2	17.81	2.79
25.1	16.52	19.42	25.2	4.35	40.60	25.2	38.22	16.11	25.2	35.79	24.58	25.2	17.67	2.66
26.1	16.44	19.17	26.2	4.15	40.35	26.2	38.13	15.90	26.2	35.35	24.59	26.2	17.55	2.53
27.1	16.37	18.92	27.2	3.93	40.14	27.2	38.04	15.70	27.2	34.90	24.60	27.2	17.42	2.40
28.1	16.28	18.69	28.2	3.71	39.94	28.2	37.94	15.51	28.2	34.46	24.56	28.2	17.28	2.29
29.1	16.18	18.45	29.2	3.48	39.73	29.2	37.82	15.34	29.2	34.03	24.49	29.2	17.14	2.19
30.1	16.08	18.21	30.2	3.22	39.51	30.2	37.69	15.17	30.2	33.63	24.42	30.2	16.98	2.10
31.1	15.96	17.96	31.2	2.94	39.29	31.2	37.57	14.99	31.2	33.28	24.35	31.2	16.80	2.01
32.1	15.83	17.67	32.1	2.64	39.06	32.2	37.43	14.78	32.2	32.94	24.28	32.2	16.63	1.91
8.33		−8.27	15.90		−15.87	7.03		−6.96	18.24		+18.21	7.65		−7.58
21^{h}	38^{m}	$10^{\mathrm{s}}.025$	22^{h}	15^{m}	$56^{\mathrm{s}}.333$	22^{h}	37^{m}	$32^{\mathrm{s}}.703$	23^{h}	27^{m}	$44^{\mathrm{s}}.392$	23^{h}	47^{m}	$12^{\mathrm{s}}.813$
−83°	6′	23″.31	−86°	23′	45″.22	−81°	49′	21″.11	+86°	50′	39″.03	−82°	29′	8″.43

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	**33 Piscium.** Mag. 4.7				**α Andromedæ.** (*Alpheratz.*) Mag. 2.2				**β Cassiopeiæ.** Mag. 2.4				**ε Phœnicis.** Mag. 3.9			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	0 1		− 6 10		0 4		+28 37		0 4		+58 41		0 5		−46 12	
	s		″		s		″		s		″		s		″	
Jan. 0.2	2.843	100	37.03	53	2.970	131	50.08	87	41.151	300	33.48	68	9.974	195	49.66	38
10.2	2.743	93	37.56	44	2.839	125	49.21	114	40.851	288	32.80	120	9.779	181	49.28	83
20.2	2.650	82	38.00	30	2.714	112	48.07	134	40.563	265	31.60	167	9.598	158	48.45	128
30.1	2.568	67	38.30	14	2.602	95	46.73	149	40.298	227	29.93	207	9.440	133	47.17	168
Feb. 9.1	2.501	46	38.44	— 4	2.507	70	45.24	159	40.071	181	27.86	236	9.307	100	45.49	205
19.1	2.455	21	38.40	22	2.437	39	43.65	160	39.890	120	25.50	259	9.207	63	43.44	237
29.1	2.434	— 10	38.18	44	2.398	4	42.05	153	39.770	52	22.91	268	9.144	21	41.07	265
Mar. 10.0	2.444	43	37.74	68	2.394	— 38	40.52	139	39.718	— 22	20.23	267	9.123	— 25	38.42	286
20.0	2.487	80	37.06	91	2.432	83	39.13	118	39.740	102	17.56	253	9.148	74	35.56	303
30.0	2.567	118	36.15	115	2.515	130	37.95	90	39.842	182	15.03	231	9.222	125	32.53	312
Apr. 9.0	2.685	158	35.00	139	2.645	176	37.05	57	40.024	258	12.72	198	9.347	177	29.41	316
18.9	2.843	196	33.61	159	2.821	220	36.48	20	40.282	330	10.74	157	9.524	227	26.25	315
28.9	3.039	232	32.02	179	3.041	260	36.28	— 19	40.612	392	9.17	111	9.751	275	23.10	304
May 8.9	3.271	261	30.23	193	3.301	295	36.47	58	41.004	444	8.06	61	10.026	318	20.06	289
18.8	3.532	288	28.30	205	3.596	322	37.05	95	41.448	485	7.45	8	10.344	353	17.17	266
28.8	3.820	308	26.25	212	3.918	340	38.00	133	41.933	511	7.37	— 45	10.697	380	14.51	239
June 7.8	4.128	318	24.13	211	4.258	352	39.33	165	42.444	523	7.82	97	11.077	400	12.12	204
17.8	4.446	321	22.02	206	4.610	352	40.98	193	42.967	523	8.79	146	11.477	408	10.08	164
27.7	4.767	315	19.96	197	4.962	344	42.91	217	43.490	509	10.25	192	11.885	406	8.44	121
July 7.7	5.082	302	17.99	182	5.306	329	45.08	235	43.999	481	12.17	231	12.291	391	7.23	75
17.7	5.384	281	16.17	164	5.635	305	47.43	247	44.480	445	14.48	267	12.682	368	6.48	26
27.7	5.665	255	14.53	141	5.940	275	49.90	253	44.925	398	17.15	296	13.050	336	6.22	— 21
Aug. 6.6	5.920	222	13.12	115	6.215	239	52.43	255	45.323	344	20.11	317	13.386	293	6.43	67
16.6	6.142	186	11.97	90	6.454	201	54.98	251	45.667	286	23.28	334	13.679	245	7.10	112
26.6	6.328	150	11.07	59	6.655	160	57.49	241	45.953	223	26.62	342	13.924	189	8.22	150
Sept. 5.5	6.478	107	10.48	33	6.815	118	59.90	228	46.176	160	30.04	344	14.113	134	9.72	182
15.5	6.585	71	10.15	10	6.933	78	62.18	211	46.336	95	33.48	340	14.247	76	11.54	209
25.5	6.656	33	10.05	— 14	7.011	40	64.29	190	46.431	33	36.88	328	14.323	21	13.63	223
Oct. 5.5	6.689	2	10.19	36	7.051	5	66.19	167	46.464	— 26	40.16	308	14.344	— 34	15.86	231
15.4	6.691	— 29	10.55	50	7.056	— 28	67.86	142	46.438	82	43.24	285	14.310	81	18.17	228
25.4	6.662	52	11.05	60	7.028	54	69.28	114	46.356	133	46.09	252	14.229	122	20.45	214
Nov. 4.4	6.610	73	11.65	71	6.974	80	70.42	85	46.223	180	48.61	215	14.107	156	22.59	194
14.4	6.537	85	12.36	76	6.894	97	71.27	54	46.043	220	50.76	172	13.951	181	24.53	163
24.3	6.452	98	13.12	76	6.797	114	71.81	22	45.823	253	52.48	124	13.770	199	26.16	126
Dec. 4.3	6.354	105	13.88	74	6.683	124	72.03	— 10	45.570	278	53.72	72	13.571	208	27.42	85
14.3	6.249	107	14.62	69	6.559	131	71.93	41	45.292	294	54.44	19	13.363	210	28.27	40
24.2	6.142	104	15.31	60	6.428	134	71.52	73	44.998	302	54.63	— 36	13.153	206	28.67	— 7
34.2	6.038		15.91		6.294		70.79		44.696		54.27		12.947		28.60	
Mean Place	2.184		38.90		2.546		36.11		41.242		11.42		9.038		39.56	
Sec δ, Tan δ	1.006		−0.108		1.140		+0.546		1.924		+1.645		1.445		−1.043	
$D_\psi \alpha$, $D_\omega \alpha$	+0.06		+0.01		+0.06		−0.04		+0.06		−0.11		+0.06		+0.07	
$D_\psi \delta$, $D_\omega \delta$	+0.4		0.0		+0.4		0.0		+0.4		0.0		+0.4		0.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	22 Andromedæ. Mag. 5.1				γ Pegasi. Mag. 2.9				σ Andromedæ. Mag. 4.5				ι Ceti. Mag. 3.8			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	0 5		+45 36		0 8		+14 42		0 13		+36 19		0 15		− 9 16	
	s		″		s		″		s		″		s		″	
Jan. 0.2	57.232		36.43		55.081		69.24		56.546		27.00		9.662		81.06	
10.2	57.038	194	35.63	80	54.973	108	68.45	79	56.393	153	26.21	79	9.556	106	81.58	52
20.2	56.851	187	34.41	122	54.869	104	67.55	90	56.242	151	25.10	111	9.455	101	81.95	37
30.2	56.681	170	32.83	158	54.774	95	66.58	97	56.103	139	23.69	141	9.364	91	82.15	20
Feb. 9.1	56.534	147	30.95	188	54.696	78	65.57	101	55.982	121	22.05	164	9.286	78	82.17	2
19.1	56.420	114	28.84	211	54.636	60	64.58	99	55.887	95	20.25	180	9.227	59	81.99	18
29.1	56.348	72	26.61	223	54.604	32	63.66	92	55.827	60	18.39	186	9.193	34	81.60	39
Mar. 10.0	56.324	24	24.35	226	54.602	2	62.88	78	55.805	22	16.52	187	9.186	7	80.98	62
20.0	56.353	29	22.17	218	54.637	35	62.27	61	55.829	24	14.76	176	9.214	28	80.13	85
30.0	56.440	87	20.15	202	54.711	74	61.90	37	55.904	75	13.18	158	9.279	65	79.04	109
Apr. 9.0	56.588	148	18.39	176	54.827	116	61.80	10	56.029	125	11.85	133	9.382	103	77.73	131
18.9	56.792	204	16.95	144	54.986	159	61.99	19	56.205	176	10.85	100	9.525	143	76.18	155
28.9	57.051	259	15.92	103	55.185	199	62.50	51	56.431	226	10.21	64	9.709	184	74.44	174
May 8.9	57.358	307	15.33	59	55.420	235	63.32	82	56.700	269	9.98	23	9.930	221	72.53	191
18.8	57.707	349	15.20	13	55.690	270	64.46	114	57.007	307	10.16	18	10.184	254	70.49	204
28.8	58.088	381	15.56	36	55.986	296	65.87	141	57.346	339	10.79	63	10.466	282	68.35	214
June 7.8	58.492	404	16.38	82	56.300	314	67.54	167	57.706	360	11.82	103	10.769	303	66.18	217
17.8	58.906	414	17.66	128	56.627	327	69.41	187	58.079	373	13.21	139	11.085	316	64.03	215
27.7	59.322	416	19.35	169	56.956	329	71.43	202	58.453	374	14.97	176	11.407	322	61.95	208
July 7.7	59.727	405	21.40	205	57.279	323	73.58	215	58.821	368	17.03	206	11.726	319	60.00	195
17.7	60.113	386	23.78	238	57.589	310	75.77	219	59.175	354	19.36	233	12.033	307	58.21	179
27.7	60.470	357	26.43	265	57.879	290	77.97	220	59.504	329	21.87	251	12.324	291	56.66	155
Aug. 6.6	60.790	320	29.26	283	58.140	261	80.10	213	59.801	297	24.53	266	12.588	264	55.34	132
16.6	61.070	280	32.24	298	58.371	231	82.15	205	60.064	263	27.22	269	12.823	235	54.31	103
26.6	61.302	232	35.31	307	58.566	195	84.06	191	60.286	222	29.97	275	13.022	199	53.57	74
Sept. 5.5	61.487	185	38.38	307	58.722	156	85.80	174	60.466	180	32.68	271	13.183	161	53.12	45
15.5	61.622	135	41.40	302	58.840	118	87.35	155	60.601	135	35.32	264	13.305	122	52.97	15
25.5	61.709	87	44.32	292	58.920	80	88.68	133	60.695	94	37.81	249	13.389	84	53.08	11
Oct. 5.5	61.748	39	47.08	276	58.966	46	89.78	110	60.747	52	40.12	231	13.438	49	53.43	35
15.4	61.743	5	49.62	254	58.978	12	90.66	88	60.760	13	42.22	210	13.451	13	53.98	55
25.4	61.699	44	51.92	230	58.960	18	91.31	65	60.738	22	44.07	185	13.433	18	54.69	71
Nov. 4.4	61.617	82	53.89	197	58.918	42	91.74	43	60.685	53	45.62	155	13.391	42	55.50	81
14.4	61.502	115	55.51	162	58.854	64	91.94	20	60.603	82	46.87	125	13.326	65	56.38	88
24.3	61.362	140	56.75	124	58.773	81	91.95	1	60.498	105	47.78	91	13.245	81	57.27	89
Dec. 4.3	61.198	164	57.56	81	58.680	93	91.74	21	60.372	126	48.32	54	13.151	94	58.15	88
14.3	61.018	180	57.93	37	58.576	104	91.35	39	60.234	138	48.51	19	13.048	103	58.97	82
24.2	60.827	191	57.84	9	58.466	110	90.78	57	60.085	149	48.31	20	12.940	108	59.69	72
34.2	60.630	197	57.30	54	58.354	112	90.05	73	59.929	156	47.73	58	12.830	110	60.30	61
Mean Place	57.008		17.41		54.507		59.83		56.123		10.37		8.902		82.15	
Sec δ, Tan δ	1.430		+1.022		1.034		+0.263		1.241		+0.735		1.013		−0.164	
Dψ α, Dω α	+0.06		−0.07		+0.06		−0.02		+0.06		−0.05		+0.06		+0.01	
Dψ δ, Dω δ	+0.4		0.0		+0.4		0.0		+0.4		+0.1		+0.4		+0.1	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ζ Tucanæ. Mag. 4.3				44 Piscium. Mag. 6.0				β Hydri. Mag. 2.9				α Phœnicis. Mag. 2.4			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 0 15		° ′ −65 21		h m 0 21		° ′ + 1 28		h m 0 21		° ′ −77 43		h m 0 22		° ′ −42 45	
	s		″		s		″		s		″		s		″	
Jan. 0.2	43.62	40	78.50	81	6.493	104	33.26	66	23.38	92	52.78	104	9.166	186	52.75	11
10.2	43.22	38	77.69	137	6.389	100	32.60	63	22.46	85	51.74	163	8.980	176	52.64	56
20.2	42.84	34	76.32	191	6.289	93	31.97	56	21.61	77	50.11	217	8.804	159	52.08	100
30.2	42.50	29	74.41	236	6.196	81	31.41	47	20.84	68	47.94	265	8.645	139	51.08	140
Feb. 9.1	42 21	24	72.05	277	6.115	61	30.94	36	20.16	56	45.29	307	8.506	111	49.68	179
19.1	41.97	17	69.28	312	6.054	40	30.58	19	19.60	43	42.22	338	8.395	78	47.89	212
29.1	41.80	10	66.16	337	6.014	11	30.39	2	19.17	27	38.84	364	8.317	41	45.77	242
Mar. 10.0	41.70	2	62.79	359	6.003	24	30.37	19	18.90	14	35.20	379	8.276	2	43.35	268
20.0	41.68	6	59.20	367	6.027	60	30.56	43	18.76	2	31.41	388	8.278	49	40.67	286
30.0	41.74	14	55.53	373	6.087	99	30.99	68	18.78	18	27.53	387	8.327	99	37.81	301
Apr. 9.0	41.88	21	51.80	368	6.186	140	31.67	92	18.96	33	23.66	379	8.426	148	34.80	308
18.9	42.09	30	48.12	356	6.326	180	32.59	120	19.29	48	19.87	361	8.574	197	31.72	311
28.9	42.39	38	44.56	339	6.506	218	33.79	142	19.77	63	16.26	338	8.771	245	28.61	304
May 8.9	42.77	44	41.17	310	6.724	252	35.21	164	20.40	75	12.88	306	9.016	289	25.57	295
18.9	43.21	51	38.07	278	6.976	278	36.85	181	21.15	86	9.82	267	9.305	324	22.62	276
28.8	43.72	55	35.29	238	7.254	302	38.66	194	22.01	96	7.15	224	9.629	356	19.86	251
June 7.8	44.27	58	32.91	193	7.556	314	40.60	203	22.97	102	4.91	175	9.985	375	17.35	220
17.8	44.85	60	30.98	143	7.870	320	42.63	208	23.99	107	3.16	121	10.360	388	15.15	186
27.7	45.45	60	29.55	89	8.190	317	44.71	205	25.06	108	1.95	66	10.748	388	13.29	143
July 7.7	46.05	59	28.66	35	8.507	307	46.76	198	26.14	107	1.29	7	11.136	380	11.86	100
17.7	46.64	57	28.31	20	8.814	289	48.74	186	27.21	101	1.22	51	11.516	360	10.86	52
27.7	47.21	51	28.51	75	9.103	265	50.60	170	28.22	94	1.73	106	11.876	332	10.34	5
Aug. 6.6	47.72	45	29.26	127	9.368	236	52.30	151	29.16	84	2.79	158	12.208	295	10.29	42
16.6	48.17	39	30.53	173	9.604	201	53.81	128	30.00	71	4.37	205	12.503	252	10.71	87
26.6	48.56	30	32.26	215	9.805	166	55.09	103	30.71	54	6.42	245	12.755	203	11.58	128
Sept. 5.6	48.86	21	34.41	247	9.971	127	56.12	78	31.25	37	8.87	274	12.958	151	12.86	164
15.5	49.07	10	36.88	269	10.098	93	56.90	53	31.62	19	11.61	296	13.109	97	14.50	192
25.5	49.17	2	39.57	282	10.191	55	57.43	30	31.81	0	14.57	305	13.206	44	16.42	213
Oct. 5.5	49.19	7	42.39	283	10.246	22	57.73	8	31.81	19	17.62	302	13.250	6	18.55	224
15.4	49.12	16	45.22	273	10.268	6	57.81	10	31.62	37	20.64	288	13.244	50	20.79	226
25.4	48.96	24	47.95	249	10.262	33	57.71	29	31.25	53	23.52	260	13.194	92	23.05	217
Nov. 4.4	48.72	30	50.44	218	10.229	53	57.42	41	30.72	67	26.12	222	13.102	127	25.22	202
14.4	48.42	36	52.62	176	10.176	73	57.01	51	30.05	79	28.34	176	12.975	152	27.24	175
24.3	48.06	39	54.38	127	10.103	85	56.50	61	29.26	88	30.10	121	12.823	173	28.99	144
Dec. 4.3	47.67	42	55.65	73	10.018	96	55.89	66	28.38	93	31.31	61	12.650	186	30.43	106
14.3	47.25	43	56.38	16	9.922	103	55.23	68	27.45	94	31.92	1	12.464	192	31.49	63
24.3	46.82	42	56.54	45	9.819	107	54.55	69	26.51	94	31.91	64	12.272	192	32.12	18
34.2	46.40		56.09		9.712		53.86		25.57		31.27		12.080		32.30	
Mean Place	42.336		65.12		5.761		28.25		21.425		38.37		8.145		43.75	
Sec δ, Tan δ	2.399		−2.180		1.000		+0.026		4.703		−4.596		1.362		−0.925	
Dψ α, Dω α	+0.06		+0.15		+0.06		0.00		+0.05		+0.31		+0.06		+0.06	
Dψ δ, Dω δ,	+0.4		+0.1		+0.4		+0.1		+0.4		+0.1		+0.4		+0.1	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	12 Ceti. Mag. 6.0				13 Ceti. Mag. 5.2				ζ Cassiopeiæ. Mag. 3.7				π Andromedæ. Mag. 4.4			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	0 25		−4 24		0 30		−4 2		0 32		+53 26		0 32		+33 15	
	s		″		s		″		s		″		s		″	
Jan. 0.2	45.927		73.56		56.251		74.95		17.451		26.88		24.028		41.74	
10.2	45.821	106	74.16	60	56.146	106	75.55	60	17.203	248	26.46	42	23.883	145	41.08	66
20.2	45.719	102	74.66	50	56.042	104	76.07	52	16.955	248	25.54	92	23.737	146	40.13	95
30.2	45.623	96	75.04	38	55.944	98	76.46	39	16.719	236	24.18	136	23.598	139	38.90	123
Feb. 9.1	45.539	84	75.27	23	55.858	86	76.71	25	16.506	213	22.42	176	23.474	124	37.46	144
19.1	45.473	66	75.35	8	55.788	70	76.80	9	16.327	179	20.35	207	23.370	104	35.88	158
29.1	45.429	44	75.24	11	55.741	47	76.71	9	16.194	133	18.06	229	23.297	73	34.19	169
Mar. 10.1	45.414	15	74.91	33	55.721	20	76.41	30	16.115	79	15.64	242	23.259	38	32.51	168
20.0	45.431	17	74.36	55	55.734	13	75.86	55	16.098	17	13.19	245	23.264	5	30.93	158
30.0	45.486	55	73.58	78	55.784	50	75.12	74	16.151	53	10.83	236	23.316	52	29.49	144
Apr. 9.0	45.578	92	72.55	103	55.872	88	74.12	100	16.273	122	8.66	217	23.418	102	28.29	120
18.9	45.713	135	71.28	127	56.002	130	72.88	124	16.466	193	6.77	189	23.570	152	27.37	92
28.9	45.888	175	69.79	149	56.174	172	71.41	147	16.725	259	5.22	155	23.771	201	26.80	57
May 8.9	46.100	212	68.09	170	56.382	208	69.74	167	17.046	321	4.09	113	24.019	248	26.61	19
18.9	46.348	248	66.23	186	56.626	244	67.88	186	17.419	373	3.42	67	24.304	285	26.81	20
28.8	46.623	275	64.23	200	56.899	273	65.91	197	17.836	417	3.23	19	24.625	321	27.40	59
June 7.8	46.922	299	62.15	208	57.196	297	63.83	208	18.285	449	3.53	30	24.970	345	28.37	97
17.8	47.234	312	60.04	211	57.507	311	61.73	210	18.751	466	4.32	79	25.330	360	29.71	134
27.8	47.554	320	57.95	209	57.828	321	59.63	210	19.225	474	5.57	125	25.697	367	31.37	166
July 7.7	47.872	318	55.94	201	58.146	318	57.61	202	19.695	470	7.25	168	26.061	364	33.31	194
17.7	48.180	308	54.04	190	58.458	312	55.72	189	20.147	452	9.32	207	26.413	352	35.49	218
27.7	48.473	293	52.34	170	58.753	295	53.99	173	20.574	427	11.72	240	26.745	332	37.84	235
Aug. 6.6	48.741	268	50.82	152	59.025	272	52.47	152	20.965	391	14.42	270	27.051	306	40.32	248
16.6	48.981	240	49.56	126	59.268	243	51.20	127	21.314	349	17.32	290	27.324	273	42.86	254
26.6	49.187	206	48.56	100	59.480	212	50.18	102	21.615	301	20.41	309	27.561	237	45.42	256
Sept. 5.6	49.356	169	47.85	71	59.654	174	49.43	75	21.863	248	23.57	316	27.758	197	47.95	253
15.5	49.489	133	47.40	45	59.792	138	48.97	46	22.058	195	26.78	321	27.914	156	50.39	244
25.5	49.585	96	47.23	17	59.892	100	48.77	20	22.197	139	29.95	317	28.029	115	52.70	231
Oct. 5.5	49.644	59	47.29	6	59.958	66	48.81	4	22.283	86	33.03	308	28.104	75	54.84	214
15.5	49.669	25	47.57	28	59.990	32	49.08	27	22.317	34	35.96	293	28.142	38	56.80	196
25.4	49.665	4	48.02	45	59.991	1	49.53	45	22.300	17	38.68	272	28.146	4	58.51	171
Nov. 4.4	49.634	31	48.61	59	59.966	25	50.10	57	22.237	63	41.13	245	28.117	29	59.97	146
14.4	49.581	53	49.31	70	59.919	47	50.80	70	22.129	108	43.25	212	28.061	56	61.15	118
24.3	49.509	72	50.06	75	59.851	68	51.55	75	21.985	144	45.00	175	27.978	83	62.02	87
Dec. 4.3	49.424	85	50.84	78	59.769	82	52.33	78	21.804	181	46.32	132	27.875	103	62.56	54
14.3	49.327	97	51.61	77	59.675	94	53.10	77	21.594	210	47.18	86	27.753	122	62.77	21
24.3	49.223	104	52.33	72	59.573	102	53.84	74	21.363	231	47.54	36	27.617	136	62.64	13
34.2	49.116	107	53.00	67	59.466	107	54.52	68	21.117	246	47.41	13	27.473	144	62.17	47
Mean Place	45.133		76.57		55.429		78.18		17.061		5.23		23.421		25.61	
Sec δ, Tan δ	1.003		−0.077		1.002		−0.071		1.679		+1.348		1.196		+0.656	
$D_{\psi}\alpha$, $D_{\omega}\alpha$	+0.06		+0.01		+0.06		0.00		+0.07		−0.09		+0.06		−0.04	
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.4		+0.1		+0.4		+0.1		+0.4		+0.1		+0.4		+0.1	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ε Andromedæ. Mag. 4.5				δ Andromedæ. Mag. 3.5				α Cassiopeiæ. (*Schedir.*) Var. 2.2–2.8				μ Phœnicis. Mag. 4.6			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 0 34 s		° ′ +28 51 ″		h m 0 34 s		° ′ +30 24 ″		h m 0 35 s		° ′ +56 4 ″		h m 0 37 s		° ′ −46 32 ″	
Jan. 0.2	7.439	134	35.73	68	50.593	137	20.13	66	44.278	272	58.95	35	22.601	213	56.55	5
10.2	7.305	135	35.05	93	50.456	138	19.47	93	44.006	273	58.60	86	22.388	205	56.50	53
20.2	7.170	129	34.12	116	50.318	133	18.54	117	43.733	260	57.74	132	22.183	192	55.97	101
30.2	7.041	115	32.96	134	50.185	118	17.37	136	43.473	237	56.42	174	21.991	172	54.96	145
Feb. 9.1	6.926	97	31.62	144	50.067	100	16.01	149	43.236	201	54.68	208	21.819	144	53.51	186
19.1	6.829	68	30.18	150	49.967	71	14.52	156	43.035	152	52.60	233	21.675	111	51.65	223
29.1	6.761	35	28.68	147	49.896	36	12.96	154	42.883	93	50.27	248	21.564	72	49.42	255
Mar. 10.1	6.726	$\overline{5}$	27.21	138	49.860	$\overline{4}$	11.42	145	42.790	27	47.79	252	21.492	26	46.87	280
20.0	6.731	49	25.83	120	49.864	49	9.97	129	42.763	$\overline{46}$	45.27	246	21.466	$\overline{22}$	44.07	302
30.0	6.780	97	24.63	98	49.913	97	8.68	105	42.809	121	42.81	229	21.488	74	41.05	317
Apr. 9.0	6.877	144	23.65	67	50.010	147	7.63	76	42.930	197	40.52	201	21.562	129	37.88	325
18.9	7.021	192	22.98	35	50.157	195	6.87	44	43.127	268	38.51	168	21.691	181	34.63	327
28.9	7.213	235	22.63	0	50.352	239	6.43	7	43.395	333	36.83	127	21.872	233	31.36	322
May 8.9	7.448	275	22.63	38	50.591	277	6.36	$\overline{31}$	43.728	390	35.56	81	22.105	282	28.14	308
18.9	7.723	307	23.01	75	50.868	312	6.67	69	44.118	437	34.75	32	22.387	323	25.06	291
28.8	8.030	331	23.76	110	51.180	336	7.36	104	44.555	469	34.43	$\overline{17}$	22.710	357	22.15	265
June 7.8	8.361	347	24.86	142	51.516	352	8.40	138	45.024	492	34.60	67	23.067	385	19.50	232
17.8	8.708	355	26.28	172	51.868	359	9.78	170	45.516	499	35.27	115	23.452	399	17.18	194
27.8	9.063	351	28.00	196	52.227	357	11.48	194	46.015	494	36.42	160	23.851	406	15.24	152
July 7.7	9.414	341	29.96	216	52.584	345	13.42	217	46.509	480	38.02	200	24.257	398	13.72	104
17.7	9.755	323	32.12	230	52.929	327	15.59	230	46.989	451	40.02	236	24.655	383	12.68	56
27.7	10.078	296	34.42	238	53.256	301	17.89	241	47.440	416	42.38	267	25.038	357	12.12	4
Aug. 6.6	10.374	266	36.80	242	53.557	269	20.30	246	47.856	371	45.05	290	25.395	321	12.08	$\overline{44}$
16.6	10.640	231	39.22	239	53.826	236	22.76	245	48.227	322	47.95	310	25.716	278	12.52	93
26.6	10.871	192	41.61	234	54.062	195	25.21	240	48.549	267	51.05	321	25.994	227	13.45	136
Sept. 5.6	11.063	153	43.95	223	54.257	156	27.61	230	48.816	212	54.26	326	26.221	175	14.81	175
15.5	11.216	114	46.18	207	54.413	117	29.91	216	49.028	151	57.52	326	26.396	119	16.56	207
25.5	11.330	75	48.25	191	54.530	77	32.07	199	49.179	94	60.78	318	26.515	62	18.63	227
Oct. 5.5	11.405	41	50.16	169	54.607	42	34.06	179	49.273	39	63.96	303	26.577	9	20.90	242
15.5	11.446	5	51.85	147	54.649	8	35.85	156	49.312	$\overline{15}$	66.99	284	26.586	$\overline{43}$	23.32	245
25.4	11.451	$\overline{24}$	53.32	121	54.657	$\overline{24}$	37.41	131	49.297	65	69.83	258	26.543	88	25.77	236
Nov. 4.4	11.427	51	54.53	95	54.633	50	38.72	104	49.232	114	72.41	225	26.455	128	28.13	220
14.4	11.376	75	55.48	67	54.583	76	39.76	74	49.118	156	74.66	189	26.327	161	30.33	194
24.3	11.301	95	56.15	38	54.507	96	40.50	45	48.962	194	76.55	145	26.166	185	32.27	160
Dec. 4.3	11.206	112	56.53	7	54.411	114	40.95	13	48.768	227	78.00	98	25.981	204	33.87	120
14.3	11.094	124	56.60	$\overline{23}$	54.297	127	41.08	$\overline{19}$	48.541	253	78.98	46	25.777	214	35.07	75
24.3	10.970	134	56.37	53	54.170	137	40.89	48	48.288	268	79.44	$\overline{4}$	25.563	218	35.82	27
34.2	10.836		55.84		54.033		40.41		48.020		79.40		25.345		36.09	
Mean Place	6.788		20.97		49.946		4.85		43.885		36.64		21.444		46.93	
Sec δ, Tan δ	1.142		+0.551		1.160		+0.587		1.792		+1.487		1.454		−1.055	
$D_\psi \alpha$, $D_\omega \alpha$	+0.06		−0.04		+0.06		−0.04		+0.07		−0.10		+0.06		+0.07	
$D_\omega \delta$	+0.4		+0.1		+0.4		+0.2		+0.4		+0.2		+0.4		+0.2	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Ceti. Mag. 2.2				o Cassiopeiæ. Mag. 4.7				21 Cassiopeiæ. Mag. 5.6				ζ Andromedæ. Mag. 4.3			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	0 39		−18 26		0 40		+47 49		0 40		+74 31		0 42		+23 48	
	s		″		s		″		s		″		s		″	
Jan. 0.3	23.380	120	52.18	48	2.836	207	49.98	42	4.51	69	70.44	7	53.721	124	50.79	65
10.2	23.260	118	52.66	21	2.629	209	49.56	87	3.82	70	70.51 —	56	53.597	126	50.14	85
20.2	23.142	112	52.87 —	3	2.420	202	48.69	128	3.12	66	69.95	113	53.471	122	49.29	102
30.2	23.030	101	52.84	31	2.218	185	47.41	163	2.46	60	68.82	168	53.349	112	48.27	117
Feb. 9.1	22.929	85	52.53	58	2.033	156	45.78	190	1.86	53	67.14	215	53.237	95	47.10	123
19.1	22.844	61	51.95	85	1.877	119	43.88	211	1.33	41	64.99	252	53.142	70	45.87	125
29.1	22.783	33	51.10	111	1.758	73	41.77	222	0.92	27	62.47	278	53.072	39	44.62	120
Mar. 10.1	22.750	3	49.99	136	1.685	18	39.55	222	0.65	14	59.69	293	53.033	3	43.42	110
20.0	22.747 —	37	48.63	162	1.667 —	42	37.33	212	0.51 —	1	56.76	296	53.030 —	39	42.32	92
30.0	22.784	77	47.01	183	1.709	104	35.21	195	0.52	18	53.80	286	53.069	86	41.40	69
Apr. 9.0	22.861	119	45.18	205	1.813	167	33.26	167	0.70	33	50.94	265	53.155	131	40.71	42
19.0	22.980	162	43.13	218	1.980	228	31.59	133	1.03	47	48.29	236	53.286	178	40.29	10
28.9	23.142	202	40.95	231	2.208	285	30.26	96	1.50	61	45.93	196	53.464	221	40.19 —	23
May 8.9	23.344	238	38.64	239	2.493	334	29.30	51	2.11	71	43.97	150	53.685	259	40.42	57
18.9	23.582	272	36.25	241	2.827	373	28.79	5	2.82	80	42.47	99	53.944	293	40.99	90
28.8	23.854	297	33.84	238	3.200	405	28.74 —	41	3.62	86	41.48	45	54.237	316	41.89	122
June 7.8	24.151	315	31.46	228	3.605	424	29.15	86	4.48	91	41.03 —	10	54.553	335	43.11	150
17.8	24.466	326	29.18	213	4.029	433	30.01	129	5.39	93	41.13	64	54.888	342	44.61	176
27.8	24.792	328	27.05	194	4.462	430	31.30	169	6.32	93	41.77	117	55.230	342	46.37	194
July 7.7	25.120	322	25.11	167	4.892	418	32.99	204	7.25	89	42.94	168	55.572	334	48.31	211
17.7	25.442	306	23.44	138	5.310	395	35.03	234	8.14	85	44.62	214	55.906	318	50.42	220
27.7	25.748	285	22.06	105	5.705	365	37.37	259	8.99	78	46.76	255	56.224	293	52.62	224
Aug. 6.7	26.033	257	21.01	70	6.070	329	39.96	278	9.77	70	49.31	291	56.517	265	54.86	224
16.6	26.290	224	20.31	35	6.399	285	42.74	291	10.47	59	52.22	320	56.782	233	57.10	219
26.6	26.514	188	19.96 —	1	6.684	240	45.65	297	11.06	50	55.42	344	57.015	195	59.29	209
Sept. 5.6	26.702	149	19.97	34	6.924	191	48.62	299	11.56	40	58.86	359	57.210	159	61.38	196
15.5	26.851	109	20.31	65	7.115	143	51.61	295	11.96	27	62.45	368	57.369	121	63.34	181
25.5	26.960	70	20.96	89	7.258	95	54.56	284	12.23	15	66.13	369	57.490	84	65.15	160
Oct. 5.5	27.030	34	21.85	111	7.353	48	57.40	269	12.38	3	69.82	364	57.574	50	66.75	141
15.5	27.064	1	22.96	124	7.401	4	60.09	248	12.41 —	8	73.46	348	57.624	17	68.16	119
25.4	27.065 —	29	24.20	133	7.405 —	38	62.57	221	12.33	19	76.94	327	57.641 —	12	69.35	96
Nov. 4.4	27.036	54	25.53	134	7.367	76	64.78	192	12.14	32	80.21	296	57.629	37	70.31	71
14.4	26.982	77	26.87	130	7.291	111	66.70	156	11.82	41	83.17	258	57.592	62	71.02	47
24.4	26.905	94	28.17	118	7.180	142	68.26	117	11.41	50	85.75	213	57.530	82	71.49	21
Dec. 4.3	26.811	106	29.35	105	7.038	169	69.43	74	10.91	58	87.88	160	57.448	99	71.70 —	3
14.3	26.705	117	30.40	86	6.869	188	70.17	30	10.33	64	89.48	104	57.349	113	71.67	29
24.3	26.588	122	31.26	63	6.681	203	70.47 —	17	9.69	68	90.52	43	57.236	123	71.38	52
34.2	26.466		31.89		6.478		70.30		9.01		90.95		57.113		70.86	
an Place	22.431		50.64		2.285		29.55		4.601		44.93		52.972		37.52	
δ, Tan δ	1.054		−0.334		1.490		+1.104		3.750		+3.615		1.093		+0.441	
α, $D_{10}\alpha$	+0.06		+0.02		+0.07		−0.07		+0.08		−0.24		+0.06		−0.03	
δ, $D_{10}\delta$	+0.4		+0.2		+0.4		+0.2		+0.4		+0.2		+0.4		+0.2	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	**η Cassiopeiæ.** Mag. 3.6				**δ Piscium.** Mag. 4.6				**λ Hydri.** Mag. 5.0				**20 Ceti.** Mag. 4.9			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 0 43		° ′ +57 22		h m 0 44		° ′ + 7 7		h m 0 45		° ′ −75 22		h m 0 48		° ′ − 1 35	
	s		″		s		″		s		″		s		″	
Jan. 0.3	61.062		39.09		20.205		48.83		43.33		63.02		43.723		55.61	
10.2	60.782	280	38.84	25	20.097	108	48.16	67	42.54	79	62.40	62	43.616	107	56.26	65
20.2	60.498	284	38.09	75	19.989	108	47.46	70	41.77	77	61.17	123	43.507	109	56.83	57
30.2	60.224	274	36.85	124	19.884	105	46.77	69	41.05	72	59.38	179	43.401	106	57.32	49
Feb. 9.1	59.972	252	35.16	169	19.787	97	46.11	66	40.40	65	57.07	231	43.303	98	57.67	35
19.1	59.756	216	33.14	202	19.705	82	45.53	58	39.84	56	54.31	276	43.220	83	57.87	20
29.1	59.588	168	30.84	230	19.646	59	45.05	48	39.38	46	51.17	314	43.157	63	57.91	4 —
Mar. 10.1	59.480	108	28.34	250	19.613	33	44.71	34	39.04	34	47.71	346	43.121	36	57.74	17
20.0	59.441	39 —	25.80	254	19.612	1 —	44.57	14 —	38.81	23	44.06	365	43.115	6 —	57.38	36
30.0	59.476	35	23.29	251	19.650	38	44.64	7	38.72	9 —	40.27	379	43.146	31	56.78	60
Apr. 9.0	59.588	112	20.92	237	19.728	78	44.95	31	38.76	4	36.41	386	43.217	71	55.95	83
19.0	59.781	193	18.80	212	19.848	120	45.51	56	38.93	17	32.59	382	43.331	114	54.86	109
28.9	60.048	267	17.01	179	20.011	163	46.35	84	39.23	30	28.87	372	43.485	154	53.55	131
May 8.9	60.383	335	15.61	140	20.214	203	47.45	110	39.66	43	25.35	352	43.679	194	52.03	152
18.9	60.778	395	14.66	95	20.452	238	48.79	134	40.22	56	22.08	327	43.909	230	50.30	173
28.8	61.223	445	14.19	47 —	20.723	271	50.36	157	40.88	66	19.16	292	44.172	263	48.43	187
June 7.8	61.707	484	14.22	3	21.017	294	52.10	174	41.63	75	16.64	252	44.460	288	46.44	199
17.8	62.213	506	14.74	52	21.330	313	53.99	189	42.45	82	14.58	206	44.766	306	44.38	206
27.8	62.731	518	15.75	101	21.651	321	55.98	199	43.32	87	13.02	156	45.083	317	42.31	207
July 7.7	63.247	516	17.21	146	21.973	322	58.02	204	44.22	90	12.00	102	45.401	318	40.27	204
17.7	63.748	501	19.08	187	22.288	315	60.04	202	45.12	90	11.57	43 —	45.715	314	38.34	193
27.7	64.224	476	21.34	226	22.588	300	62.00	196	45.99	87	11.74	17	46.013	298	36.55	179
Aug. 6.7	64.664	440	23.92	258	22.868	280	63.85	185	46.82	83	12.47	73	46.293	280	34.95	160
16.6	65.062	398	26.74	282	23.120	252	65.55	170	47.57	75	13.75	128	46.547	254	33.56	139
26.6	65.408	346	29.78	304	23.340	220	67.07	152	48.22	65	15.54	179	46.769	222	32.42	114
Sept. 5.6	65.702	294	32.95	317	23.528	188	68.39	132	48.74	52	17.78	224	46.959	190	31.54	88
15.5	65.937	235	36.20	325	23.679	151	69.47	108	49.13	39	20.39	261	47.113	154	30.95	59
25.5	66.113	176	39.45	325	23.795	116	70.33	86	49.37	24	23.27	288	47.231	118	30.62	33
Oct. 5.5	66.230	117	42.65	320	23.876	81	70.95	62	49.45	8 —	26.32	305	47.313	82	30.52	10 —
15.5	66.289	59	45.73	308	23.924	48	71.35	40	49.38	7	29.40	308	47.364	51	30.65	13
25.4	66.291	2 —	48.63	290	23.941	17 —	71.54	19	49.15	23	32.41	301	47.382	18 —	30.98	33
Nov. 4.4	66.241	50	51.28	265	23.932	9	71.55	1 —	48.76	39	35.21	280	47.374	8	31.47	49
14.4	66.139	102	53.62	234	23.898	34	71.39	16	48.26	50	37.71	250	47.341	33	32.07	60
24.4	65.991	148	55.59	197	23.843	55	71.08	31	47.65	61	39.79	208	47.287	54	32.78	71
Dec. 4.3	65.802	189	57.15	156	23.770	73	70.66	42	46.95	70	41.37	158	47.213	74	33.51	73
14.3	65.576	226	58.25	110	23.683	87	70.13	53	46.19	76	42.38	101	47.127	86	34.27	76
24.3	65.321	255	58.83	58	23.585	98	69.53	60	45.40	79	42.78	40 —	47.028	99	35.01	74
34.2	65.045	276	58.90	7	23.479	106	68.87	66	44.59	81	42.57	21	46.921	107	35.70	69
Mean Place	60.577		16.35		19.361		41.35		41.158		49.23		42.811		60.06	
Sec δ, Tan δ	1.855		+1.563		1.008		+0.125		3.961		−3.833		1.000		−0.028	
$D_\psi \alpha$, $D_\omega \alpha$	+0.07		−0.10		+0.06		−0.01		+0.04		+0.26		+0.06		0.00	
ψ, $D_\omega \delta$	+0.4		+0.2		+0.4		+0.2		+0.4		+0.2		+0.4		+0.2	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Cassiopeiæ. Mag. 2.2				μ Andromedæ. Mag. 3.9				α Sculptoris. Mag. 4.4				ε Piscium. Mag. 4.4			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 0 51		° ′ +60 15		h m 0 52		° ′ +38 2		h m 0 54		° ′ −29 48		h m 0 58		° ′ + 7 26	
	s		″		s		″		s		″		s		″	
Jan. 0.3	38.19		67.11		5.882		56.15		34.590		45.99		35.851		25.16	
10.2	37.87	32	67.03	8	5.723	159	55.71	44	34.444	146	46.41	42	35.743	108	24.51	65
20.2	37.55	32	66.41	62	5.558	165	54.90	81	34.297	147	46.46	5 —	35.631	112	23.83	68
30.2	37.23	32	65.29	112	5.397	161	53.78	112	34.155	142	46.14	32	35.519	112	23.16	67
Feb. 9.2	36.94	29	63.70	159	5.246	151	52.40	138	34.024	131	45.47	67	35.415	104	22.51	65
19.1	36.69	25	61.71	199	5.116	130	50.79	161	33.911	113	44.44	103	35.323	92	21.93	58
29.1	36.48	21	59.43	228	5.014	102	49.05	174	33.819	92	43.08	136	35.251	72	21.45	48
Mar. 10.1	36.34	14	56.93	250	4.949	65	47.24	181	33.758	61	41.41	167	35.204	47	21.11	34
20.0	36.28	6 —	54.33	260	4.928	21 —	45.46	178	33.731	27 —	39.46	195	35.189	15 —	20.95	16 —
30.0	36.30	2	51.75	258	4.956	28	43.80	166	33.743	12	37.24	222	35.212	23	20.99	4
Apr. 9.0	36.39	9	49.28	247	5.038	82	42.30	150	33.799	56	34.83	241	35.276	64	21.27	28
19.0	36.58	19	47.04	224	5.175	137	41.08	122	33.900	101	32.23	260	35.383	107	21.79	52
28.9	36.84	26	45.09	195	5.366	191	40.16	92	34.047	147	29.53	270	35.532	149	22.59	80
May 8.9	37.19	35	43.54	155	5.606	240	39.62	54	34.238	191	26.75	278	35.722	190	23.63	104
18.9	37.60	41	42.41	113	5.892	286	39.46	16 —	34.470	232	23.96	279	35.951	229	24.93	130
28.9	38.07	47	41.77	64	6.215	323	39.70	24	34.740	270	21.23	273	36.213	262	26.44	151
June 7.8	38.58	51	41.62	15 —	6.568	353	40.35	65	35.041	301	18.62	261	36.502	289	28.15	171
17.8	39.11	53	41.98	36	6.941	373	41.39	104	35.364	323	16.19	243	36.810	308	29.99	184
27.8	39.66	55	42.83	85	7.324	383	42.77	138	35.702	338	14.00	219	37.129	319	31.94	195
July 7.7	40.21	55	44.15	132	7.709	385	44.50	173	36.046	344	12.10	190	37.451	322	33.93	199
17.7	40.75	54	45.92	177	8.085	376	46.49	199	36.386	340	10.56	154	37.768	317	35.93	200
27.7	41.26	51	48.08	216	8.443	358	48.72	223	36.715	329	9.40	116	38.072	304	37.86	193
Aug. 6.7	41.74	48	50.58	250	8.778	335	51.12	240	37.025	310	8.66	74	38.359	287	39.70	184
16.6	42.17	43	53.37	279	9.081	303	53.65	253	37.308	283	8.35	31 —	38.619	260	41.39	169
26.6	42.54	37	56.40	303	9.348	267	56.25	260	37.557	249	8.46	11	38.852	233	42.91	152
Sept. 5.6	42.87	33	59.58	318	9.577	229	58.86	261	37.768	211	8.98	52	39.050	198	44.22	131
15.6	43.13	26	62.87	329	9.765	188	61.43	257	37.938	170	9.90	92	39.215	165	45.30	108
25.5	43.33	20	66.20	333	9.911	146	63.92	249	38.065	127	11.15	125	39.344	129	46.17	87
Oct. 5.5	43.47	14	69.49	329	10.015	104	66.29	237	38.150	85	12.68	153	39.440	96	46.79	62
15.5	43.54	7	72.70	321	10.080	65	68.48	219	38.194	44	14.41	173	39.503	63	47.20	41
25.4	43.55	1 —	75.73	303	10.107	27 —	70.48	200	38.199	5 —	16.25	184	39.534	31	47.39	19
Nov. 4.4	43.49	6	78.55	282	10.099	8	72.24	176	38.169	30	18.15	190	39.538	4 —	47.41	2 —
14.4	43.39	10	81.07	252	10.058	41	73.73	149	38.108	61	20.00	185	39.516	22	47.27	14
24.4	43.23	16	83.22	215	9.987	71	74.90	117	38.021	87	21.73	173	39.473	43	46.97	30
Dec. 4.3	43.02	21	84.96	174	9.890	97	75.75	85	37.911	110	23.26	153	39.408	65	46.56	41
14.3	42.77	25	86.24	128	9.768	122	76.25	50	37.785	126	24.55	129	39.328	80	46.05	51
24.3	42.49	28	87.01	77	9.628	140	76.38	13 —	37.646	139	25.55	100	39.233	95	45.46	59
34.3	42.18	31	87.24	23	9.472	156	76.14	24	37.499	147	26.20	65	39.128	105	44.81	65
Mean Place	37.632		43.70		5.138		38.24		33.480		41.17		34.919		17.32	
Sec δ, Tan δ	2.016		+1.751		1.270		+0.783		1.153		−0.573		1.008		+0.131	
$D_\psi \alpha$, $D_\omega \alpha$	+0.07		−0.11		+0.07		−0.05		+0.06		+0.04		+0.06		−0.01	
$D_\psi \delta$, $D_\omega \delta$	+0.4		+0.2		+0.4		+0.2		+0.4		+0.2		+0.4		+0.2	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Phœnicis. Mag. 3.4				μ Cassiopeiæ. Mag. 5.3				η Ceti. Mag. 3.6				β Andromedæ. Mag. 2.4			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 1 2		° ′ −47 9		h m 1 2		° ′ +54 30		h m 1 4		° ′ −10 37		h m 1 5		° ′ +35 10	
	s		″		s		″		s		″		s		″	
Jan. 0.3	21.461	225	76.52	22	40.997	241	54.31	13	22.891	113	36.22	64	2.281	147	48.93	39
10.2	21.236	224	76.74	28	40.756	251	54.18	60	22.778	116	36.86	48	2.134	156	48.54	71
20.2	21.012	215	76.46	78	40.505	248	53.58	107	22.662	116	37.34	27	1.978	156	47.83	99
30.2	20.797	201	75.68	124	40.257	234	52.51	150	22.546	110	37.61	7	1.822	149	46.84	126
Feb. 9.2	20.596	176	74.44	169	40.023	206	51.01	187	22.436	98	37.68	16	1.673	132	45.58	145
19.1	20.420	149	72.75	209	39.817	166	49.14	214	22.338	78	37.52	39	1.541	107	44.13	158
29.1	20.271	111	70.66	244	39.651	115	47.00	234	22.260	54	37.13	63	1.434	73	42.55	164
Mar. 10.1	20.160	67	68.22	273	39.536	55	44.66	242	22.206	23	36.50	87	1.361	33	40.91	163
20.0	20.093	18	65.49	299	39.481	15	42.24	242	22.183	13	35.63	112	1.328	15	39.28	152
30.0	20.075	33	62.50	316	39.496	86	39.82	231	22.196	52	34.51	135	1.343	66	37.76	136
Apr. 9.0	20.108	89	59.34	329	39.582	161	37.51	208	22.248	94	33.16	159	1.409	118	36.40	111
19.0	20.197	147	56.05	333	39.743	234	35.43	180	22.342	137	31.57	178	1.527	172	35.29	81
28.9	20.344	199	52.72	332	39.977	299	33.63	144	22.479	179	29.79	195	1.699	221	34.48	48
May 8.9	20.543	252	49.40	323	40.276	362	32.19	103	22.658	217	27.84	211	1.920	267	34.00	11
18.9	20.795	298	46.17	305	40.638	411	31.16	58	22.875	252	25.73	219	2.187	306	33.89	26
28.9	21.093	339	43.12	283	41.049	451	30.58	10	23.127	279	23.54	223	2.493	336	34.15	65
June 7.8	21.432	368	40.29	252	41.500	480	30.48	36	23.406	302	21.31	222	2.829	359	34.80	100
17.8	21.800	391	37.77	215	41.980	496	30.84	82	23.708	314	19.09	215	3.188	372	35.80	134
27.8	22.191	403	35.62	173	42.476	497	31.66	127	24.022	320	16.94	203	3.560	375	37.14	165
July 7.7	22.594	403	33.89	127	42.973	490	32.93	166	24.342	318	14.91	186	3.935	370	38.79	190
17.7	22.997	392	32.62	76	43.463	470	34.59	205	24.660	306	13.05	163	4.305	354	40.69	212
27.7	23.389	372	31.86	26	43.933	441	36.64	235	24.966	290	11.42	137	4.659	335	42.81	226
Aug. 6.7	23.761	341	31.60	28	44.374	406	38.99	260	25.256	265	10.05	106	4.994	305	45.07	238
16.6	24.102	303	31.88	78	44.780	362	41.59	281	25.521	237	8.99	75	5.299	273	47.45	243
26.6	24.405	258	32.66	125	45.142	313	44.40	295	25.758	204	8.24	43	5.572	237	49.88	244
Sept. 5.6	24.663	206	33.91	168	45.455	262	47.35	304	25.962	169	7.81	11	5.809	199	52.32	240
15.6	24.869	153	35.59	203	45.717	209	50.39	307	26.131	133	7.70	20	6.008	158	54.72	232
25.5	25.022	95	37.62	229	45.926	155	53.46	301	26.264	97	7.90	46	6.166	119	57.04	219
Oct. 5.5	25.117	42	39.91	248	46.081	102	56.47	293	26.361	63	8.36	70	6.285	81	59.23	202
15.5	25.159	11	42.39	257	46.183	48	59.40	277	26.424	30	9.06	88	6.366	46	61.25	185
25.4	25.148	60	44.96	253	46.231	3	62.17	255	26.454	1	9.94	101	6.412	10	63.10	161
Nov. 4.4	25.088	104	47.49	240	46.228	51	64.72	228	26.455	27	10.95	109	6.422	23	64.71	136
14.4	24.984	141	49.89	217	46.177	97	67.00	193	26.428	49	12.04	112	6.399	52	66.07	109
24.4	24.843	173	52.06	185	46.080	138	68.93	157	26.379	70	13.16	109	6.347	81	67.16	78
Dec. 4.3	24.670	197	53.91	147	45.942	177	70.50	114	26.309	87	14.25	102	6.266	104	67.94	48
14.3	24.473	215	55.38	103	45.765	207	71.64	67	26.222	100	15.27	91	6.162	126	68.42	13
24.3	24.258	225	56.41	55	45.558	232	72.31	17	26.122	111	16.18	76	6.036	142	68.55	21
34.3	24.033		56.96		45.326		72.48		26.011		16.94		5.894		68.34	
Mean Place	20.127		67.34		40.235		31.99		21.845		37.79		1.411		31.73	
Sec δ, Tan δ	1.471		−1.079		1.723		+1.403		1.017		−0.188		1.223		+0.705	
$D_\psi \alpha$, $D_\omega \alpha$	+0.05		+0.07		+0.07		−0.09		+0.06		+0.01		+0.07		−0.05	
$D_\psi \delta$, $D_\omega \delta$	+0.4		+0.3		+0.4		+0.3		+0.4		+0.3		+0.4		+0.3	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	τ Piscium. Mag. 4.7				ζ Piscium. Mag. 5.6				κ Tucanæ. Mag. 5.0				f Piscium. Mag. 5.3			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension		Declination.		Right Ascension.		Declination.	
	h m 1 7		° ′ +29 38		h m 1 9		° ′ + 7 7		h m 1 12		° ′ −69 18		h m 1 13		° ′ + 3 10	
	s		″		s		″		s		″		s		″	
Jan. 0.3	2.697		53.88		21.462		61.16		57.35		92.96		28.932		27.20	
		133		44		107		63		56		8		106		67
10.2	2.564		53.44		21.355		60.53		56.79		92.88		28.826		26.53	
		141		72		114		67		54		70		113		63
20.2	2.423		52.72		21.241		59.86		56.25		92.18		28.713		25.90	
		141		94		113		67		52		127		115		57
30.2	2.282		51.78		21.128		59.19		55.73		90.91		28.598		25.33	
		136		115		109		62		49		182		109		51
Feb. 9.2	2.146		50.63		21.019		58.57		55.24		89.09		28.489		24.82	
		120		129		99		56		44		231		101		41
19.1	2.026		49.34		20.920		58.01		54.80		86.78		28.388		24.41	
		99		138		79		44		38		275		83		26
29.1	1.927		47.96		20.841		57.57		54.42		84.03		28.305		24.15	
		67		140		55		31		31		310		59		11
Mar. 10.1	1.860		46.56		20.786		57.26		54.11		80.93		28.246		24.04	—
		30		136		23		14		22		339		29		8
20.1	1.830	—	45.20		20.763	—	57.12	—	53.89		77.54		28.217	—	24.12	
		14		121		11		5		13		361		9		28
30.0	1.844		43.99		20.774		57.17		53.76		73.93		28.226		24.40	
		61		105		53		28		4		372		46		52
Apr. 9.0	1.905		42.94		20.827		57.45		53.72	—	70.21		28.272		24.92	
		111		80		96		52		6		379		88		77
19.0	2.016		42.14		20.923		57.97		53.78		66.42		28.360		25.69	
		161		53		140		78		17		376		135		100
28.9	2.177		41.61		21.063		58.75		53.95		62.66		28.495		26.69	
		207		20		181		103		26		364		175		124
May 8.9	2.384		41.41	—	21.244		59.78		54.21		59.02		28.670		27.93	
		254		17		220		127		35		347		214		145
18.9	2.638		41.58		21.464		61.05		54.56		55.55		28.884		29.38	
		290		49		256		148		44		320		249		166
28.9	2.928		42.07		21.720		62.53		55.00		52.35		29.133		31.04	
		319		85		282		170		52		285		279		181
June 7.8	3.247		42.92		22.002		64.23		55.52		49.50		29.412		32.85	
		340		117		303		183		58		245		298		192
17.8	3.587		44.09		22.305		66.06		56.10		47.05		29.710		34.77	
		355		145		317		191		63		199		311		196
27.8	3.942		45.54		22.622		67.97		56.73		45.06		30.021		36.73	
		357		173		322		196		66		146		318		198
July 7.8	4.299		47.27		22.944		69.93		57.39		43.60		30.339		38.71	
		353		192		320		195		67		91		318		195
17.7	4.652		49.19		23.264		71.88		58.06		42.69		30.657		40.66	
		341		210		308		191		66		33		307		186
27.7	4.993		51.29		23.572		73.79		58.72		42.36	—	30.964		42.52	
		320		219		291		182		64		26		290		170
Aug. 6.7	5.313		53.48		23.863		75.61		59.36		42.62		31.254		44.22	
		293		226		266		166		59		84		269		153
16.6	5.606		55.74		24.129		77.27		59.95		43.46		31.523		45.75	
		262		227		240		148		53		138		241		134
26.6	5.868		58.01		24.369		78.75		60.48		44.84		31.764		47.09	
		228		224		207		129		45		190		210		109
Sept. 5.6	6.096		60.25		24.576		80.04		60.93		46.74		31.974		48.18	
		192		215		174		105		36		233		177		84
15.6	6.288		62.40		24.750		81.09		61.29		49.07		32.151		49.02	
		154		204		142		81		26		266		143		61
25.5	6.442		64.44		24.892		81.90		61.55		51.73		32.294		49.63	
		117		191		106		60		15		292		109		35
Oct. 5.5	6.559		66.35		24.998		82.50		61.70		54.65		32.403		49.98	
		80		172		74		39		4		306		77		12
15.5	6.639		68.07		25.072		82.89		61.74	—	57.71		32.480		50.10	—
		46		152		44		17		8		308		46		9
25.5	6.685		69.59		25.116		83.06	—	61.66		60.79		32.526		50.01	
		14		131		16		3		18		299		16		25
Nov. 4.4	6.699	—	70.90		25.132	—	83.03		61.48		63.78		32.542	—	49.76	
		17		107		12		18		27		274		9		40
14.4	6.682		71.97		25.120		82.85		61.21		66.52		32.533		49.36	
		44		81		35		32		36		239		34		50
24.4	6.638		72.78		25.085		82.53		60.85		68.91		32.499		48.86	
		71		55		56		43		43		198		56		60
Dec. 4.3	6.567		73.33		25.029		82.10		60.42		70.89		32.443		48.26	
		92		26		77		53		49		148		74		68
14.3	6.475		73.59	—	24.952		81.57		59.93		72.37		32.369		47.58	
		112		1		88		59		53		91		90		67
24.3	6.363		73.58		24.864		80.98		59.40		73.28		32.279		46.91	
		128		30		104		64		55		32		102		68
34.3	6.235		73.28		24.760		80.34		58.85		73.60		32.177		46.23	
Mean Place	1.793		38.39		20.465		53.28		55.270		80.40		27.895		20.65	
Sec δ, Tan δ	1.151		+0.569		1.008		+0.125		2.831		−2.649		1.002		+0.055	
$D_\psi \alpha$, $D_\omega \alpha$	+0.07		−0.04		+0.06		−0.01		+0.04		+0.18		+0.06		0.00	
$D_\psi \delta$, $D_\omega \delta$	+0.4		+0.3		+0.4		+0.3		+0.4		+0.3		+0.4		+0.3	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	υ Piscium. Mag. 4.7				θ Ceti. Mag. 3.8				δ Cassiopeiæ. Mag. 2.8				γ Phœnicis. Mag. 3.4			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 1 14		° ′ +26 49		h m 1 19		° ′ − 8 36		h m 1 20		° ′ +59 47		h m 1 24		° ′ −43 44	
	s		″		s		″		s		″		s		″	
Jan. 0.3	51.701		37.05		50.570		56.77		19.534		80.96		44.535		62.54	
10.3	51.575	126	36.62	43	50.459	111	57.47	70	19.235	299	81.20	24 —	44.328	207	63.06	52
20.2	51.440	135	35.94	68	50.340	119	58.02	55	18.920	315	80.92	28	44.115	213	63.10	4 —
30.2	51.302	138	35.07	87	50.219	121	58.39	37	18.601	319	80.12	80	43.905	210	62.67	43
Feb. 9.2	51.168	134	34.02	105	50.103	116	58.56	17 —	18.296	305	78.85	127	43.703	202	61.76	91
19.1	51.048	120	32.84	118	49.995	108	58.52	4	18.016	280	77.15	170	43.518	185	60.40	136
29.1	50.947	101	31.59	125	49.904	91	58.26	26	17.780	236	75.10	205	43.357	161	58.61	179
Mar. 10.1	50.875	72	30.34	125	49.837	67	57.77	49	17.599	181	72.80	230	43.229	128	56.47	214
20.1	50.839	36 —	29.15	119	49.799	38	57.04	73	17.486	113	70.34	246	43.138	91	53.98	240
30.0	50.845	6	28.07	108	49.796	3 —	56.07	97	17.452	34 —	67.82	252	43.092	46 —	51.23	275
Apr. 9.0	50.897	52	27.17	90	49.832	36	54.85	122	17.501	49	65.35	247	43.097	5	48.24	299
19.0	50.998	101	26.52	65	49.911	79	53.42	143	17.635	134	63.04	231	43.153	56	45.10	314
29.0	51.149	151	26.13	39	50.033	122	51.75	167	17.852	217	60.97	207	43.264	111	41.86	324
May 8.9	51.346	197	26.06	7 —	50.198	165	49.91	184	18.150	298	59.24	173	43.428	164	38.59	327
18.9	51.586	240	26.32	26	50.403	205	47.91	200	18.520	370	57.88	136	43.644	216	35.36	323
28.9	51.864	278	26.90	58	50.642	239	45.79	212	18.952	432	56.96	92	43.908	264	32.25	311
June 7.8	52.173	309	27.80	90	50.913	271	43.62	217	19.433	481	56.51	45 —	44.213	305	29.32	293
17.8	52.504	331	29.01	121	51.206	293	41.42	220	19.951	518	56.53	2	44.550	337	26.65	267
27.8	52.849	345	30.48	147	51.516	310	39.29	213	20.493	542	57.04	51	44.914	364	24.30	235
July 7.8	53.200	351	32.19	171	51.833	317	37.24	205	21.043	550	58.01	97	45.292	378	22.34	196
17.7	53.547	347	34.07	188	52.150	317	35.34	190	21.591	548	59.41	140	45.676	384	20.81	153
27.7	53.883	336	36.10	203	52.457	307	33.66	168	22.121	530	61.23	182	46.054	378	19.77	104
Aug. 6.7	54.201	318	38.22	212	52.751	294	32.22	144	22.626	505	63.41	218	46.419	365	19.23	54
16.7	54.494	293	40.37	215	53.023	272	31.06	116	23.094	468	65.90	249	46.758	339	19.20	3 —
26.6	54.758	264	42.52	215	53.268	245	30.21	85	23.517	423	68.65	275	47.065	307	19.70	50
Sept. 5.6	54.989	231	44.61	209	53.482	214	29.66	55	23.888	371	71.60	295	47.333	268	20.69	99
15.6	55.185	196	46.61	200	53.665	183	29.44	22 —	24.205	317	74.69	309	47.556	223	22.11	142
25.5	55.344	159	48.49	188	53.812	147	29.52	8	24.463	258	77.86	317	47.731	175	23.94	183
Oct. 5.5	55.467	123	50.22	173	53.924	112	29.89	37	24.660	197	81.05	319	47.856	125	26.10	216
15.5	55.557	90	51.76	154	54.002	78	30.49	60	24.796	136	84.20	315	47.929	73	28.47	237
25.5	55.611	54	53.12	136	54.049	47	31.29	80	24.870	74	87.23	303	47.953	24 —	30.98	251
Nov. 4.4	55.634	23 —	54.26	114	54.065	16 —	32.23	94	24.884	14 —	90.09	286	47.930	23	33.53	255
14.4	55.628	6	55.19	93	54.054	11	33.27	104	24.838	46	92.71	262	47.864	66	36.00	247
24.4	55.593	35	55.88	69	54.018	36	34.36	109	24.734	104	95.03	232	47.759	105	38.31	231
Dec. 4.4	55.532	61	56.33	45	53.960	58	35.44	108	24.577	157	96.97	194	47.621	138	40.34	203
14.3	55.449	83	56.52	19 —	53.881	79	36.46	102	24.370	207	98.49	152	47.455	166	42.03	169
24.3	55.345	104	56.47	5	53.787	94	37.40	94	24.120	250	99.55	106	47.267	188	43.32	129
34.3	55.224	121	56.16	31	53.680	107	38.22	82	23.836	284	100.10	55	47.064	203	44.16	84
Mean Place	50.728		22.39		49.446		59.31		18.542		57.48		43.107		54.70	
Sec δ, Tan δ	1.121		+0.506		1.011		−0.151		1.988		+1.718		1.384		−0.957	
$D_\psi a$, $D_\omega a$	+0.06		−0.03		+0.06		+0.01		+0.08		−0.11		+0.05		+0.06	
$D_\psi \delta$, $D_\omega \delta$	+0.4		+0.3		+0.4		+0.3		+0.4		+0.3		+0.4		+0.4	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	38 Cassiopeiæ. Mag. 6.0				η Piscium. Mag. 3.7				40 Cassiopeiæ. Mag. 5.5				υ Andromedæ. Mag. 4.2			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 1 24 s		° ′ +69 49 ″		h m 1 26 s		° ′ +14 54 ″		h m 1 31 s		° ′ +72 36 ″		h m 1 31 s		° ′ +40 59 ″	
Jan. 0.3	58.53	49	83.47	54	60.217	109	58.23	54	47.91	56	70.71	71	52.738	162	27.77	6
10.3	58.04	51	84.01	— 5	60.108	121	57.69	65	47.35	60	71.42	11	52.576	176	27.71	46
20.2	57.53	51	83.96	61	59.987	124	57.04	73	46.75	61	71.53	— 50	52.400	184	27.25	79
30.2	57.02	49	83.35	116	59.863	123	56.31	76	46.14	59	71.03	107	52.216	183	26.46	112
Feb. 9.2	56.53	45	82.19	169	59.740	113	55.55	78	45.55	54	69.96	158	52.033	169	25.34	137
19.1	56.08	38	80.50	209	59.627	98	54.77	75	45.01	47	68.38	204	51.864	144	23.97	160
29.1	55.70	31	78.41	242	59.529	72	54.02	68	44.54	38	66.34	240	51.720	113	22.37	175
Mar. 10.1	55.39	20	75.99	266	59.457	43	53.34	57	44.16	26	63.94	267	51.607	71	20.62	177
20.1	55.19	9	73.33	278	59.414	5	52.77	40	43.90	14	61.27	280	51.536	22	18.85	175
30.0	55.10	— 3	70.55	277	59.409	— 37	52.37	20	43.76	— 1	58.47	284	51.514	— 34	17.10	167
Apr. 9.0	55.13	16	67.78	266	59.446	83	52.17	— 2	43.77	14	55.63	276	51.548	91	15.43	149
19.0	55.29	27	65.12	247	59.529	128	52.19	29	43.91	29	52.87	257	51.639	149	13.94	124
29.0	55.56	39	62.65	214	59.657	172	52.48	54	44.20	42	50.30	229	51.788	207	12.70	93
May 8.9	55.95	49	60.51	177	59.829	215	53.02	83	44.62	53	48.01	193	51.995	258	11.77	57
18.9	56.44	58	58.74	135	60.044	251	53.85	108	45.15	65	46.08	150	52.253	302	11.20	21
28.9	57.02	65	57.39	86	60.295	281	54.93	132	45.80	73	44.58	103	52.555	342	10.99	— 18
June 7.8	57.67	71	56.53	37	60.576	306	56.25	152	46.53	79	43.55	53	52.897	371	11.17	55
17.8	58.38	74	56.16	— 15	60.882	320	57.77	170	47.32	83	43.02	2	53.268	388	11.72	92
27.8	59.12	75	56.31	66	61.202	329	59.47	181	48.15	86	43.00	— 51	53.656	398	12.64	129
July 7.8	59.87	76	56.97	116	61.531	328	61.28	189	49.01	86	43.51	101	54.054	397	13.93	157
17.7	60.63	73	58.13	161	61.859	319	63.17	192	49.87	84	44.52	148	54.451	387	15.50	184
27.7	61.36	70	59.74	205	62.178	304	65.09	189	50.71	80	46.00	193	54.838	371	17.34	208
Aug. 6.7	62.06	66	61.79	242	62.482	284	66.98	183	51.51	76	47.93	231	55.209	344	19.42	224
16.7	62.72	59	64.21	276	62.766	256	68.81	172	52.27	69	50.24	268	55.553	316	21.66	236
26.6	63.31	52	66.97	301	63.022	228	70.53	157	52.96	60	52.92	298	55.869	282	24.02	244
Sept. 5.6	63.83	45	69.98	323	63.250	195	72.10	141	53.56	53	55.90	320	56.151	242	26.46	247
15.6	64.28	36	73.21	337	63.445	162	73.51	122	54.09	44	59.10	337	56.393	204	28.93	245
25.5	64.64	28	76.58	346	63.607	128	74.73	102	54.53	33	62.47	348	56.597	163	31.38	238
Oct. 5.5	64.92	19	80.04	346	63.735	96	75.75	83	54.86	23	65.95	352	56.760	121	33.76	228
15.5	65.11	9	83.50	338	63.831	64	76.58	61	55.09	12	69.47	347	56.881	82	36.04	212
25.5	65.20	1	86.88	325	63.895	35	77.19	44	55.21	2	72.94	336	56.963	42	38.16	193
Nov. 4.4	65.21	— 9	90.13	304	63.930	7	77.63	24	55.23	— 10	76.30	315	57.005	6	40.09	172
14.4	65.12	18	93.17	274	63.937	— 21	77.87	8	55.13	19	79.45	288	57.011	— 29	41.81	147
24.4	64.94	26	95.91	235	63.916	44	77.95	— 8	54.94	31	82.33	252	56.982	68	43.28	116
Dec. 4.4	64.68	34	98.26	194	63.872	66	77.87	24	54.63	38	84.85	208	56.914	100	44.44	85
14.3	64.34	41	100.20	142	63.806	87	77.63	37	54.25	48	86.93	159	56.814	128	45.29	49
24.3	63.93	46	101.62	88	63.719	102	77.26	49	53.77	53	88.52	105	56.686	149	45.78	13
34.3	63.47		102.50		63.617		76.77		53.24		89.57		56.537		45.91	
Mean Place	57.396		58.33		59.130		47.45		46.572		45.24		51.637		8.80	
Sec δ, Tan δ	2.902		+2.724		1.035		+0.266		3.347		+3.195		1.325		+0.869	
$D_\psi \alpha$, $D_\omega \alpha$	+0.09		−0.18		+0.06		−0.02		+0.09		−0.20		+0.07		−0.05	
$D_\psi \delta$, $D_\omega \delta$	+0.4		+0.4		+0.4		+0.4		+0.4		+0.4		+0.4		+0.4	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	π Piscium. Mag. 5.6				υ Persei. Mag. 3.8				α Eridani. (*Achernar*.) Mag. 0.6				ω Cassiopeiæ. Mag. 5.5			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	1 32		+11 42		1 32		+48 12		1 34		−57 39		1 36		+67 37	
	s		″		s		″		s		″		s		″	
Jan. 0.3	39.703		53.60		50.812		31.82		36.991		58.33		7.34		32.26	
10.3	39.597	106	53.04	56	50.617	195	31.92	10 —	36.665	326	58.76	43 —	6.93	41	32.88	62
20.2	39.480	117	52.40	64	50.404	213	31.59	33	36.333	332	58.64	12	6.47	46	32.94	6 —
30.2	39.358	122	51.72	68	50.185	219	30.85	74	36.003	330	57.96	68	6.01	46	32.43	51
Feb. 9.2	39.235	123	51.04	68	49.969	216	29.71	114	35.686	317	56.74	122	5.57	44	31.37	106
19.2	39.121	114	50.38	66	49.768	201	28.24	147	35.394	292	55.01	173	5.16	41	29.83	154
29.1	39.022	99	49.78	60	49.594	174	26.49	175	35.134	260	52.83	218	4.80	36	27.85	198
Mar. 10.1	38.945	77	49.25	53	49.458	136	24.55	194	34.917	217	50.24	259	4.51	29	25.54	231
20.1	38.899	46	48.85	40	49.370	88	22.50	205	34.750	167	47.31	293	4.31	20	22.98	256
30.0	38.890	9 —	48.65	20	49.339	31 —	20.43	207	34.642	108	44.10	321	4.20	11	20.30	268
Apr. 9.0	38.920	30	48.63	2 —	49.370	31	18.44	199	34.599	43 —	40.69	341	4.20	0	17.60	270
19.0	38.995	75	48.83	20	49.467	97	16.60	184	34.623	24	37.13	356	4.33	13	14.99	261
29.0	39.114	119	49.30	47	49.629	162	15.00	160	34.718	95	33.51	362	4.56	23	12.56	243
May 8.9	39.279	165	50.04	74	49.854	225	13.72	128	34.882	164	29.92	359	4.89	33	10.42	214
18.9	39.483	204	51.00	96	50.137	283	12.77	95	35.116	234	26.42	350	5.32	43	8.63	179
28.9	39.726	243	52.21	121	50.472	335	12.23	54	35.411	295	23.10	332	5.85	53	7.26	137
June 7.9	40.000	274	53.62	141	50.847	375	12.10	13 —	35.763	352	20.03	307	6.43	58	6.35	91
17.8	40.298	298	55.24	162	51.255	408	12.39	29	36.163	400	17.29	274	7.07	64	5.92	43 —
27.8	40.613	315	56.99	175	51.684	429	13.10	71	36.600	437	14.93	236	7.75	68	6.00	8
July 7.8	40.936	323	58.81	182	52.123	439	14.20	110	37.061	461	13.04	189	8.44	69	6.57	57
17.7	41.259	323	60.70	189	52.562	439	15.65	145	37.536	475	11.66	138	9.14	70	7.62	105
27.7	41.576	317	62.58	188	52.991	429	17.44	179	38.010	474	10.81	85	9.82	68	9.12	150
Aug. 6.7	41.878	302	64.42	184	53.400	409	19.52	208	38.470	460	10.54	27 —	10.48	66	11.04	192
16.7	42.160	282	66.16	174	53.783	383	21.82	230	38.904	434	10.83	29	11.09	61	13.33	229
26.6	42.418	258	67.75	159	54.133	350	24.31	249	39.300	396	11.69	86	11.66	57	15.97	264
Sept. 5.6	42.648	230	69.17	142	54.444	311	26.94	263	39.647	347	13.08	139	12.16	50	18.86	289
15.6	42.846	198	70.41	124	54.713	269	29.64	270	39.938	291	14.95	187	12.60	44	21.97	311
25.6	43.010	164	71.44	103	54.939	226	32.36	272	40.163	225	17.24	229	12.96	36	25.22	325
Oct. 5.5	43.144	134	72.27	83	55.119	180	35.05	269	40.321	158	19.85	261	13.25	29	28.57	335
15.5	43.243	99	72.89	62	55.254	135	37.68	263	40.408	87	22.68	283	13.46	21	31.93	336
25.5	43.312	69	73.31	42	55.343	89	40.18	250	40.425	17 —	25.62	294	13.58	12	35.24	331
Nov. 4.4	43.352	40	73.54	23	55.388	45	42.51	233	40.373	52	28.57	295	13.61	3 —	38.43	319
14.4	43.362	10 —	73.62	8 —	55.389	1 —	44.61	210	40.258	115	31.39	282	13.57	4	41.41	298
24.4	43.348	14	73.52	10	55.347	42	46.45	184	40.086	172	33.97	258	13.45	12	44.12	271
Dec. 4.4	43.307	41	73.28	24	55.264	83	47.97	152	39.864	222	36.22	225	13.25	20	46.50	238
14.3	43.244	63	72.92	36	55.143	121	49.13	116	39.600	264	38.05	183	12.97	28	48.45	195
24.3	43.161	83	72.47	45	54.988	155	49.90	77	39.303	297	39.40	135	12.63	34	49.92	147
34.3	43.062	99	71.92	55	54.805	183	50.25	35	38.984	319	40.21	81	12.24	39	50.86	94
Mean Place	38.574		43.88		49.688		10.96		35.215		47.99		6.007		7.51	
Sec δ, Tan δ	1.021		+0.207		1.500		+1.119		1.869		−1.580		2.627		+2.429	
$D_\psi \alpha$, $D_\omega \alpha$	+0.06		−0.01		+0.07		−0.07		+0.04		+0.10		+0.09		−0.15	
$D_\psi \delta$, $D_\omega \delta$	+0.4		+0.4		+0.4		+0.4		+0.4		+0.4		+0.4		+0.4	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	*ν* Piscium. Mag. 4.7				*φ* Persei. Mag. 4.2				*τ* Ceti. Mag. 3.6				*o* Piscium. Mag. 4.5			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	1 37		+ 5 3		1 38		+50 15		1 40		−16 22		1 40		+ 8 44	
	s		″		s		″		s		″		s		″	
Jan. 0.3	4.668	104	54.15	65	24.412	207	79.22	21	11.161	122	45.67	75	58.539	103	16.06	60
10.3	4.564	115	53.50	63	24.205	224	79.43	— 24	11.039	133	46.42	51	58.436	117	15.46	62
20.2	4.449	121	52.87	59	23.981	234	79.19	67	10.906	138	46.93	24	58.319	123	14.84	63
30.2	4.328	121	52.28	54	23.747	231	78.52	109	10.768	136	47.17	— 3	58.196	123	14.21	61
Feb. 9.2	4.207	113	51.74	46	23.516	216	77.43	143	10.632	128	47.14	33	58.073	117	13.60	56
19.2	4.094	101	51.28	34	23.300	191	76.00	174	10.504	113	46.81	60	57.956	103	13.04	49
29.1	3.993	78	50.94	20	23.109	150	74.26	196	10.391	92	46.21	88	57.853	82	12.55	37
Mar. 10.1	3.915	50	50.74	3	22.959	101	72.30	210	10.299	63	45.33	116	57.771	54	12.18	22
20.1	3.865	15	50.71	— 17	22.858	41	70.20	212	10.236	28	44.17	142	57.717	18	11.96	6
30.0	3.850	— 24	50.88	37	22.817	— 21	68.08	208	10.208	— 12	42.75	168	57.699	— 22	11.90	— 16
Apr. 9.0	3.874	67	51.25	61	22.838	91	66.00	194	10.220	54	41.07	189	57.721	65	12.06	38
19.0	3.941	112	51.86	85	22.929	159	64.06	171	10.274	99	39.18	209	57.786	110	12.44	62
29.0	4.053	155	52.71	109	23.088	224	62.35	142	10.373	142	37.09	225	57.896	155	13.06	87
May 8.9	4.208	197	53.80	130	23.312	287	60.93	107	10.515	186	34.84	237	58.051	197	13.93	110
18.9	4.405	233	55.10	150	23.599	339	59.86	68	10.701	224	32.47	243	58.248	234	15.03	132
28.9	4.638	266	56.60	168	23.938	384	59.18	26	10.925	257	30.04	245	58.482	266	16.35	152
June 7.9	4.904	290	58.28	180	24.322	418	58.92	— 16	11.182	283	27.59	240	58.748	292	17.87	168
17.8	5.194	308	60.08	188	24.740	442	59.08	58	11.465	303	25.19	229	59.040	310	19.55	178
27.8	5.502	318	61.96	193	25.182	453	59.66	98	11.768	314	22.90	212	59.350	319	21.33	186
July 7.8	5.820	318	63.89	190	25.635	455	60.64	136	12.082	318	20.78	191	59.669	321	23.19	187
17.7	6.138	313	65.79	183	26.090	445	62.00	171	12.400	312	18.87	163	59.990	316	25.06	184
27.7	6.451	299	67.62	172	26.535	427	63.71	201	12.712	300	17.24	131	60.306	303	26.90	177
Aug. 6.7	6.750	281	69.34	156	26.962	401	65.72	226	13.012	282	15.93	97	60.609	285	28.67	163
16.7	7.031	256	70.90	137	27.363	367	67.98	247	13.294	256	14.96	60	60.894	260	30.30	148
26.6	7.287	229	72.27	114	27.730	330	70.45	263	13.550	227	14.36	22	61.154	234	31.78	130
Sept. 5.6	7.516	198	73.41	91	28.060	286	73.08	272	13.777	196	14.14	— 15	61.388	202	33.08	107
15.6	7.714	165	74.32	67	28.346	242	75.80	276	13.973	160	14.29	48	61.590	171	34.15	87
25.6	7.879	134	74.99	43	28.588	195	78.56	277	14.133	125	14.77	80	61.761	140	35.02	63
Oct. 5.5	8.013	101	75.42	20	28.783	148	81.33	270	14.258	91	15.57	106	61.901	107	35.65	42
15.5	8.114	70	75.62	0	28.931	100	84.03	259	14.349	56	16.63	127	62.008	76	36.07	22
25.5	8.184	41	75.62	18	29.031	53	86.62	244	14.405	24	17.90	140	62.084	47	36.29	4
Nov. 4.4	8.225	12	75.44	33	29.084	6	89.06	222	14.429	— 6	19.30	147	62.131	18	36.33	— 12
14.4	8.237	— 14	75.11	46	29.090	— 38	91.28	197	14.423	34	20.77	148	62.149	— 8	36.21	27
24.4	8.223	37	74.65	54	29.052	83	93.25	164	14.389	59	22.25	141	62.141	33	35.94	37
Dec. 4.4	8.186	59	74.11	61	28.969	123	94.89	129	14.330	82	23.66	130	62.108	56	35.57	47
14.3	8.127	81	73.50	65	28.846	161	96.18	89	14.248	102	24.96	112	62.052	79	35.10	54
24.3	8.046	99	72.85	66	28.685	191	97.07	47	14.146	118	26.08	93	61.973	96	34.56	59
34.3	7.947		72.19		28.494		97.54		14.028		27.01		61.877		33.97	
Mean Place	3.497		46.67		23.218		57.89		9.908		45.85		57.351		7.28	
Sec δ, Tan δ	1.004		+0.089		1.565		+1.203		1.042		−0.294		1.012		+0.154	
$D_\psi \alpha$, $D_\omega \alpha$	+0.06		−0.01		+0.07		−0.07		+0.06		+0.02		+0.06		−0.01	
$D_\psi \delta$, $D_\omega \delta$	+0.4		+0.4		+0.4		+0.4		+0.4		+0.4		+0.4		+0.4	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ε Sculptoris. Mag. 5.4				ζ Ceti. Mag. 3.9				α Trianguli. Mag. 3.6				ε Cassiopeiæ. Mag. 3.4			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	1 41		−25 27		1 47		−10 44		1 48		+29 10		1 48		+63 15	
	s		″		s		″		s		″		s		″	
Jan. 0.3	43.824	136	81.37	80	20.108	110	56.02	82	18.559	123	27.97	21	21.67	33	49.25	66
10.3	43.688	147	82.17	49	19.998	124	56.84	61	18.436	139	27.76	46	21.34	36	49.91	12
20.2	43.541	151	82.66	13	19.874	129	57.45	41	18.297	149	27.30	69	20.98	37	50.03	42
30.2	43.390	151	82.79	23	19.745	131	57.86	18	18.148	151	26.61	88	20.61	37	49.61	93
Feb. 9.2	43.239	143	82.56	58	19.614	125	58.04	4	17.997	144	25.73	105	20.24	35	48.68	141
19.2	43.096	125	81.98	91	19.489	112	58.00	29	17.853	130	24.68	118	19.89	31	47.27	182
29.1	42.971	105	81.07	126	19.377	92	57.71	54	17.723	103	23.50	123	19.58	25	45.45	216
Mar. 10.1	42.866	73	79.81	156	19.285	65	57.17	80	17.620	71	22.27	123	19.33	19	43.29	239
20.1	42.793	38	78.25	185	19.220	31	56.37	104	17.549	30	21.04	116	19.14	9	40.90	252
30.1	42.755	3	76.40	211	19.189	8	55.33	129	17.519	17	19.88	104	19.05	1	38.38	256
Apr. 9.0	42.758	46	74.29	232	19.197	50	54.04	152	17.536	66	18.84	85	19.04	8	35.82	248
19.0	42.804	94	71.97	250	19.247	93	52.52	175	17.602	118	17.99	62	19.12	18	33.34	231
29.0	42.898	139	69.47	264	19.340	138	50.77	192	17.720	168	17.37	34	19.30	27	31.03	204
May 8.9	43.037	184	66.83	271	19.478	181	48.85	209	17.888	216	17.03	6	19.57	36	28.99	171
18.9	43.221	226	64.12	273	19.659	219	46.76	218	18.104	258	16.97	26	19.93	44	27.28	132
28.9	43.447	261	61.39	268	19.878	252	44.58	225	18.362	294	17.23	58	20.37	49	25.96	89
June 7.9	43.708	290	58.71	256	20.130	279	42.33	225	18.656	322	17.81	87	20.86	55	25.07	42
17.8	43.998	313	56.15	239	20.409	300	40.08	220	18.978	343	18.68	116	21.41	58	24.65	4
27.8	44.311	325	53.76	215	20.709	312	37.88	209	19.321	354	19.84	139	21.99	60	24.69	52
July 7.8	44.636	330	51.61	187	21.021	316	35.79	193	19.675	356	21.23	162	22.59	61	25.21	98
17.8	44.966	328	49.74	150	21.337	313	33.86	170	20.031	350	22.85	178	23.20	60	26.19	140
27.7	45.294	317	48.24	113	21.650	302	32.16	145	20.381	339	24.63	189	23.80	58	27.59	181
Aug. 6.7	45.611	297	47.11	70	21.952	285	30.71	114	20.720	319	26.52	197	24.38	55	29.40	216
16.7	45.908	274	46.41	28	22.237	262	29.57	82	21.039	293	28.49	200	24.93	51	31.56	248
26.6	46.182	243	46.13	15	22.499	236	28.75	48	21.332	265	30.49	199	25.44	46	34.04	272
Sept. 5.6	46.425	209	46.28	57	22.735	204	28.27	14	21.597	233	32.48	195	25.90	40	36.76	293
15.6	46.634	172	46.85	94	22.939	172	28.13	19	21.830	199	34.43	185	26.30	34	39.69	308
25.6	46.806	135	47.79	129	23.111	139	28.32	48	22.029	165	36.28	174	26.64	28	42.77	316
Oct. 5.5	46.941	97	49.08	156	23.250	106	28.80	76	22.194	130	38.02	159	26.92	22	45.93	317
15.5	47.038	59	50.64	175	23.356	73	29.56	96	22.324	96	39.61	144	27.14	14	49.10	314
25.5	47.097	24	52.39	187	23.429	42	30.52	114	22.420	63	41.05	127	27.28	7	52.24	301
Nov. 4.5	47.121	9	54.26	192	23.471	13	31.66	123	22.483	30	42.32	107	27.35	1	55.25	284
14.4	47.112	39	56.18	187	23.484	16	32.89	127	22.513	2	43.39	86	27.36	6	58.09	259
24.4	47.073	68	58.05	176	23.468	41	34.16	126	22.511	33	44.25	64	27.30	15	60.68	227
Dec. 4.4	47.005	93	59.81	156	23.427	65	35.42	118	22.478	62	44.89	42	27.15	19	62.95	190
14.3	46.912	114	61.37	133	23.362	85	36.60	108	22.416	88	45.31	16	26.96	26	64.85	144
24.3	46.798	130	62.70	103	23.277	104	37.68	94	22.328	112	45.47	8	26.70	30	66.29	96
34.3	46.668		63.73		23.173		38.62		22.216		45.39		26.40		67.25	
Mean Place	42.486		78.88		18.824		58.29		17.332		12.50		20.201		25.37	
Sec δ, Tan δ	1.108		−0.476		1.018		−0.190		1.145		+0.558		2.222		+1.985	
$D_\psi a$, $D_\omega a$	+0.06		+0.03		+0.06		+0.01		+0.07		−0.03		+0.08		−0.12	
$D_\psi \delta$, $D_\omega \delta$	+0.4		+0.4		+0.4		+0.5		+0.4		+0.5		+0.4		+0.5	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ξ Piscium. Mag. 4.8				β Arietis. Mag. 2.7			
	Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 1 49		° ′ + 2 46		h m 1 49		° ′ +20 23	
	s		″		s		″	
Jan. 0.3	13.568		30.74		60.982		65.06	
10.3	13.466	102	30.06	68	60.873	109	64.68	38
20.2	13.351	115	29.43	63	60.748	125	64.15	53
30.2	13.228	123	28.86	57	60.615	133	63.47	68
Feb. 9.2	13.102	126	28.37	49	60.479	136	62.69	78
19.2	12.983	119	27.99	38	60.347	132	61.84	85
29.1	12.874	109	27.75	24	60.231	116	60.96	88
Mar. 10.1	12.786	88	27.65	10	60.135	96	60.08	88
20.1	12.725	61	27.73	— 8	60.070	65	59.27	81
30.1	12.698	27	28.02	29	60.043	27	58.57	70
Apr. 9.0	12.710	— 12	28.51	49	60.058	— 15	58.03	54
19.0	12.764	54	29.24	73	60.119	61	57.69	34
29.0	12.864	100	30.20	96	60.228	109	57.58	11
May 8.9	13.006	142	31.39	119	60.384	156	57.74	— 16
18.9	13.191	185	32.78	139	60.586	202	58.17	43
28.9	13.414	223	34.37	159	60.828	242	58.88	71
June 7.9	13.671	257	36.10	173	61.103	275	59.84	96
17.8	13.953	282	37.95	185	61.406	303	61.04	120
27.8	14.256	303	39.86	191	61.728	322	62.46	142
July 7.8	14.569	313	41.78	192	62.062	334	64.06	160
17.8	14.885	316	43.67	189	62.398	336	65.77	171
27.7	15.198	313	45.47	180	62.731	333	67.58	181
Aug. 6.7	15.500	302	47.13	166	63.051	320	69.42	184
16.7	15.785	285	48.62	149	63.352	301	71.25	183
26.6	16.047	262	49.88	126	63.631	279	73.03	178
Sept. 5.6	16.284	237	50.92	104	63.882	251	74.73	170
15.6	16.490	206	51.70	78	64.103	221	76.30	157
25.6	16.666	176	52.23	53	64.293	190	77.73	143
Oct. 5.5	16.810	144	52.51	28	64.450	157	79.00	127
15.5	16.923	113	52.56	5	64.574	124	80.09	109
25.5	17.004	81	52.39	— 17	64.667	93	81.01	92
Nov. 4.5	17.057	53	52.04	35	64.728	61	81.74	73
14.4	17.080	23	51.57	47	64.758	30	82.29	55
24.4	17.077	— 3	50.97	60	64.761	3	82.67	38
Dec. 4.4	17.047	30	50.31	66	64.734	— 27	82.87	20
14.3	16.995	52	49.59	72	64.682	52	82.90	3
24.3	16.919	76	48.86	73	64.603	79	82.75	— 15
34.3	16.825	94	48.14	72	64.504	99	82.43	32
Mean Place	12.319		23.92		59.749		52.37	
Sec δ, Tan δ	1.001		+0.048		1.067		+0.372	
$D_\psi \alpha$, $D_\omega \alpha$	+0.06		0.00		+0.07		−0.02	
$D_\psi \delta$, $D_\omega \delta$	+0.4		+0.5		+0.4		+0.5	

Washington Mean Time.	ψ Phœnicis. Mag. 4.4				υ Ceti. Mag. 4.2			
	Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 1 50		° ′ −46 42		h m 1 56		° ′ −21 28	
	s		″		s		″	
Jan. 0.3	18.227		58.29		4.177		64.62	
10.3	18.001	226	59.07	78	4.051	126	65.54	92
20.2	17.764	237	59.35	28	3.912	139	66.15	61
30.2	17.523	241	59.12	— 23	3.765	147	66.44	29
Feb. 9.2	17.286	237	58.38	74	3.617	148	66.41	— 3
19.2	17.061	225	57.17	121	3.473	144	66.05	36
29.1	16.858	203	55.50	167	3.343	130	65.36	69
Mar. 10.1	16.685	173	53.42	208	3.232	111	64.36	100
20.1	16.548	137	50.97	245	3.149	83	63.05	131
30.1	16.457	91	48.22	275	3.100	49	61.45	160
Apr. 9.0	16.416	41	45.21	301	3.091	9	59.60	185
19.0	16.430	— 14	42.01	320	3.125	— 34	57.50	210
29.0	16.501	71	38.69	332	3.204	79	55.21	229
May 8.9	16.631	130	35.31	338	3.330	126	52.77	244
18.9	16.818	187	31.95	336	3.500	170	50.21	256
28.9	17.056	238	28.68	327	3.712	212	47.61	260
June 7.9	17.342	286	25.59	309	3.960	248	45.02	259
17.8	17.667	325	22.73	286	4.237	277	42.49	253
27.8	18.025	358	20.20	253	4.538	301	40.10	239
July 7.8	18.404	379	18.06	214	4.854	316	37.91	219
17.8	18.794	390	16.35	171	5.177	323	35.97	194
27.7	19.187	393	15.13	122	5.499	322	34.34	163
Aug. 6.7	19.571	384	14.44	69	5.812	313	33.07	127
16.7	19.937	366	14.28	16	6.109	297	32.18	89
26.6	20.274	337	14.67	— 39	6.385	276	31.70	48
Sept. 5.6	20.575	301	15.58	91	6.633	248	31.64	6
15.6	20.833	258	16.99	141	6.850	217	31.99	— 35
25.6	21.043	210	18.84	185	7.034	184	32.72	73
Oct. 5.5	21.203	160	21.06	222	7.182	148	33.79	107
15.5	21.311	108	23.55	249	7.294	112	35.13	134
25.5	21.366	55	26.22	267	7.371	77	36.71	158
Nov. 4.5	21.369	3	28.95	273	7.414	43	38.44	173
14.4	21.323	— 46	31.65	270	7.424	10	40.23	179
24.4	21.233	90	34.19	254	7.403	— 21	42.01	178
Dec. 4.4	21.103	130	36.50	231	7.355	48	43.71	170
14.3	20.937	166	38.47	197	7.279	76	45.26	155
24.3	20.743	194	40.04	157	7.181	98	46.62	136
34.3	20.525	218	41.15	111	7.062	119	47.72	110
Mean Place	16.598		50.53		2.792		63.65	
Sec δ, Tan δ	1.458		−1.062		1.075		−0.394	
$D_\psi \alpha$, $D_\omega \alpha$	+0.05		+0.06		+0.06		+0.02	
$D_\psi \delta$, $D_\omega \delta$	+0.4		+0.5		+0.3		+0.5	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Hydri. Mag. 3.0				50 Cassiopeiæ. Mag. 4.1				γ Andromedæ *pr.* Mag. 2.3				α Arietis. Mag. 2.2			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	1 56		−61 58		1 56		+72 0		1 58		+41 55		2 2		+23 3	
	s		″		s		″		s		″		s		″	
Jan. 0.3	9.07		52.19		15.89		81.01		45.548		57.13		27.372		70.42	
10.3	8.68	39	52.86	67	15.37	52	82.00	99	45.393	155	57.31	18	27.263	109	70.13	29
20.3	8.27	41	52.95	9	14.81	56	82.40	40	45.218	175	57.12	19	27.137	126	69.67	46
30.2	7.86	41	52.44	51	14.22	59	82.22	18	45.029	189	56.58	54	27.000	137	69.06	61
Feb. 9.2	7.47	39	51.38	106	13.64	58	81.46	76	44.835	194	55.70	88	26.857	143	68.30	76
19.2	7.10	37	49.79	159	13.09	55	80.16	130	44.648	187	54.53	117	26.716	141	67.45	85
29.1	6.76	34	47.71	208	12.60	49	78.38	178	44.480	168	53.12	141	26.588	128	66.53	92
Mar. 10.1	6.46	30	45.20	251	12.18	42	76.20	218	44.339	141	51.51	161	26.482	106	65.59	94
20.1	6.21	25	42.32	288	11.86	32	73.70	250	44.237	102	49.81	170	26.404	78	64.67	92
30.1	6.03	18	39.12	320	11.67	19	71.01	269	44.183	54	48.08	173	26.364	40	63.84	83
Apr. 9.0	5.92	11	35.68	344	11.60	7	68.23	278	44.185	2	46.41	167	26.366	2	63.16	68
19.0	5.89	3	32.09	359	11.68	8	65.47	276	44.243	58	44.85	156	26.416	50	62.64	52
29.0	5.93	4	28.42	367	11.89	21	62.84	263	44.362	119	43.50	135	26.515	99	62.35	29
May 9.0	6.07	14	24.74	368	12.23	34	60.43	241	44.540	178	42.41	109	26.662	147	62.30	5
18.9	6.27	20	21.13	361	12.70	47	58.33	210	44.774	234	41.63	78	26.856	194	62.54	24
28.9	6.55	28	17.69	344	13.27	57	56.61	172	45.058	284	41.18	45	27.091	235	63.03	49
June 7.9	6.90	35	14.47	322	13.94	67	55.33	128	45.383	325	41.10	8	27.363	272	63.81	78
17.8	7.30	40	11.58	289	14.68	74	54.51	82	45.743	360	41.38	28	27.666	303	64.83	102
27.8	7.75	45	9.08	250	15.47	79	54.18	33	46.128	385	42.02	64	27.988	322	66.09	126
July 7.8	8.24	49	7.03	205	16.30	83	54.36	18	46.528	400	43.00	98	28.324	336	67.53	144
17.8	8.76	52	5.48	155	17.14	84	55.03	67	46.933	405	44.30	130	28.666	342	69.14	161
27.7	9.28	52	4.48	100	17.98	84	56.18	115	47.332	399	45.88	158	29.005	339	70.86	172
Aug. 6.7	9.80	52	4.08	40	18.80	82	57.78	160	47.721	389	47.69	181	29.334	329	72.64	178
16.7	10.29	49	4.26	18	19.57	77	59.80	202	48.091	370	49.70	201	29.646	312	74.44	180
26.7	10.76	47	5.02	76	20.30	73	62.18	238	48.433	342	51.87	217	29.938	292	76.22	178
Sept. 5.6	11.17	41	6.35	133	20.96	66	64.89	271	48.744	311	54.14	227	30.202	264	77.94	172
15.6	11.53	36	8.19	184	21.54	58	67.86	297	49.022	278	56.46	232	30.438	236	79.56	162
25.6	11.80	27	10.48	229	22.03	49	71.03	317	49.262	240	58.79	233	30.643	205	81.07	151
Oct. 5.5	12.02	22	13.14	266	22.44	41	74.36	333	49.464	202	61.11	232	30.816	173	82.44	137
15.5	12.15	13	16.05	291	22.76	32	77.75	339	49.626	162	63.35	224	30.957	141	83.64	120
25.5	12.20	5	19.13	308	22.97	21	81.16	341	49.748	122	65.47	212	31.065	108	84.69	105
Nov. 4.5	12.17	3	22.23	310	23.07	10	84.51	335	49.830	82	67.46	199	31.141	76	85.57	88
14.4	12.05	12	25.23	300	23.06	1	87.70	319	49.872	42	69.27	181	31.187	46	86.27	70
24.4	11.88	17	28.03	280	22.95	11	90.67	297	49.875	3	70.85	158	31.201	14	86.80	53
Dec. 4.4	11.64	24	30.51	248	22.74	21	93.33	266	49.839	36	72.19	134	31.185	16	87.15	35
14.4	11.34	30	32.57	206	22.43	31	95.60	227	49.765	74	73.23	104	31.141	44	87.31	16
24.3	11.00	34	34.16	159	22.02	41	97.43	183	49.656	109	73.94	71	31.068	73	87.30	1
34.3	10.62	38	35.21	105	21.55	47	98.74	131	49.517	139	74.31	37	30.972	96	87.10	20
Mean Place	6.963		41.94		13.963		55.96		44.191		38.10		26.052		56.89	
Sec δ, Tan δ	2.128		−1.879		3.240		+3.082		1.344		+0.898		1.087		+0.426	
$D_\psi \alpha$, $D_\omega \alpha$	+0.04		+0.11		+0.10		−0.18		+0.07		−0.05		+0.07		−0.02	
$D_\psi \delta$, $D_\omega \delta$	+0.3		+0.5		+0.3		+0.5		+0.3		+0.5		+0.3		+0.5	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Trianguli. Mag. 3.1				55 Cassiopeiæ. Mag. 6.2				6 Persei. Mag. 5.4				ξ^1 Ceti. Mag. 4.5			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	2 4		+34 35		2 7		+66 7		2 8		+50 40		2 8		+ 8 27	
	s		″		s		″		s		″		s		″	
Jan. 0.3	33.772	128	42.82	3 —	54.17	35	77.23	95	2.112	190	55.44	50	34.083	96	19.94	59
10.3	33.644	149	42.85	28	53.82	40	78.18	42 —	1.922	218	55.94	7 —	33.987	115	19.35	60
20.3	33.495	163	42.57	54	53.42	42	78.60	13	1.704	235	56.01	37	33.872	125	18.75	59
30.2	33.332	169	42.03	81	53.00	43	78.47	67	1.469	242	55.64	78	33.747	132	18.16	57
Feb. 9.2	33.163	164	41.22	103	52.57	41	77.80	118	1.227	235	54.86	116	33.615	130	17.59	52
19.2	32.999	151	40.19	122	52.16	38	76.62	164	0.992	215	53.70	149	33.485	120	17.07	44
29.1	32.848	126	38.97	134	51.78	32	74.98	203	0.777	183	52.21	176	33.365	103	16.63	33
Mar. 10.1	32.722	94	37.63	139	51.46	25	72.95	230	0.594	138	50.45	194	33.262	77	16.30	20
20.1	32.628	50	36.24	139	51.21	15	70.65	251	0.456	83	48.51	205	33.185	44	16.10	5 —
30.1	32.578	3 —	34.85	131	51.06	7 —	68.14	261	0.373	19 —	46.46	205	33.141	5 —	16.05	15
Apr. 9.0	32.575	52	33.54	116	50.99	4	65.53	257	0.354	48	44.41	198	33.136	38	16.20	36
19.0	32.627	105	32.38	97	51.03	15	62.96	246	0.402	118	42.43	182	33.174	83	16.56	57
29.0	32.732	159	31.41	70	51.18	27	60.50	226	0.520	188	40.61	157	33.257	129	17.13	82
May 9.0	32.891	210	30.71	43	51.45	35	58.24	196	0.708	252	39.04	129	33.386	172	17.95	103
18.9	33.101	257	30.28	11 —	51.80	44	56.28	161	0.960	311	37.75	95	33.558	212	18.98	124
28.9	33.358	298	30.17	21	52.24	51	54.67	120	1.271	362	36.80	56	33.770	248	20.22	142
June 7.9	33.656	329	30.38	53	52.75	58	53.47	75	1.633	403	36.24	17 —	34.018	276	21.64	158
17.8	33.985	353	30.91	85	53.33	62	52.72	29 —	2.036	432	36.07	24	34.294	298	23.22	169
27.8	34.338	367	31.76	113	53.95	65	52.43	18	2.468	454	36.31	62	34.592	312	24.91	176
July 7.8	34.705	374	32.89	139	54.60	67	52.61	65	2.922	461	36.93	101	34.904	320	26.67	178
17.8	35.079	371	34.28	160	55.27	67	53.26	109	3.383	459	37.94	134	35.224	317	28.45	175
27.7	35.450	361	35.88	178	55.94	65	54.35	152	3.842	447	39.28	167	35.541	308	30.20	166
Aug. 6.7	35.811	342	37.66	190	56.59	62	55.87	189	4.289	429	40.95	194	35.849	297	31.86	156
16.7	36.153	321	39.56	200	57.21	59	57.76	225	4.718	400	42.89	217	36.146	276	33.42	141
26.7	36.474	292	41.56	204	57.80	55	60.01	254	5.118	368	45.06	235	36.422	251	34.83	121
Sept. 5.6	36.766	261	43.60	205	58.35	48	62.55	278	5.486	330	47.41	248	36.673	225	36.04	101
15.6	37.027	227	45.65	201	58.83	42	65.33	297	5.816	289	49.89	259	36.898	196	37.05	78
25.6	37.254	193	47.66	194	59.25	36	68.30	311	6.105	244	52.48	261	37.094	164	37.83	56
Oct. 5.5	37.447	157	49.60	185	59.61	27	71.41	317	6.349	198	55.09	258	37.258	135	38.39	35
15.5	37.604	121	51.45	172	59.88	20	74.58	319	6.547	152	57.67	254	37.393	105	38.74	15 —
25.5	37.725	86	53.17	156	60.08	13	77.77	312	6.699	104	60.21	244	37.498	73	38.89	5
Nov. 4.5	37.811	51	54.73	139	60.21	5 —	80.89	297	6.803	54	62.65	227	37.571	46	38.84	21
14.4	37.862	14 —	56.12	118	60.26	3	83.86	279	6.857	7 —	64.92	205	37.617	16 —	38.63	32
24.4	37.876	21	57.30	98	60.23	12	86.65	249	6.864	41	66.97	180	37.633	12	38.31	43
Dec. 4.4	37.855	53	58.28	72	60.11	20	89.14	214	6.823	89	68.77	147	37.621	38	37.88	50
14.4	37.802	86	59.00	46	59.91	26	91.28	173	6.734	132	70.24	113	37.583	63	37.38	56
24.3	37.716	116	59.46	18	59.65	32	93.01	125	6.602	171	71.37	73	37.520	87	36.82	60
34.3	37.600		59.64		59.33		94.26		6.431		72.10		37.433		36.22	
Mean Place	32.403		25.87		52.281		53.27		0.582		34.43		32.733		11.13	
Sec δ, Tan δ	1.215		+0.690		2.472		+2.261		1.578		+1.221		1.011		+0.149	
$D_\psi \alpha$, $D_\omega \alpha$	+0.07		−0.04		+0.09		−0.13		+0.08		−0.07		+0.06		−0.01	
$D_\psi \delta$, $D_\omega \delta$	+0.3		+0.5		+0.3		+0.5		+0.3		+0.5		+0.3		+0.5	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	μ Fornacis. Mag. 5.2				γ Trianguli. Mag. 4.1				67 Ceti. Mag. 5.7				φ Eridani. Mag. 3.8			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 2 9		° ′ −31 6		h m 2 12		° ′ +33 27		h m 2 12		° ′ − 6 48		h m 2 13		° ′ −51 53	
	s		″		s		″		s		″		s		″	
Jan. 0.3	13.796	149	67.39	103	20.355	123	50.00	4	48.945	100	27.80	87	32.291	262	70.59	102
10.3	13.647	165	68.42	65	20.232	143	50.04	— 24	48.845	119	28.67	70	32.029	280	71.61	49
20.3	13.482	174	69.07	25	20.089	160	49.80	49	48.726	130	29.37	54	31.749	289	72.10	— 6
30.2	13.308	177	69.32	— 16	19.929	167	49.31	76	48.596	136	29.91	35	31.460	290	72.04	59
Feb. 9.2	13.131	175	69.16	58	19.762	164	48.55	96	48.460	134	30.26	13	31.170	281	71.45	111
19.2	12.956	160	68.58	95	19.598	153	47.59	114	48.326	126	30.39	— 7	30.889	260	70.34	160
29.2	12.796	141	67.63	134	19.445	130	46.45	126	48.200	108	30.32	30	30.629	233	68.74	205
Mar. 10.1	12.655	112	66.29	169	19.315	99	45.19	131	48.092	84	30.02	53	30.396	193	66.69	244
20.1	12.543	76	64.60	201	19.216	58	43.88	132	48.008	54	29.49	77	30.203	148	64.25	278
30.1	12.467	36	62.59	227	19.158	11	42.56	124	47.954	15	28.72	101	30.055	93	61.47	308
Apr. 9.0	12.431	— 10	60.32	253	19.147	— 41	41.32	110	47.939	— 26	27.71	125	29.962	33	58.39	328
19.0	12.441	57	57.79	271	19.188	96	40.22	92	47.965	71	26.46	146	29.929	— 27	55.11	343
29.0	12.498	107	55.08	285	19.284	148	39.30	68	48.036	115	25.00	168	29.956	94	51.68	350
May 9.0	12.605	156	52.23	293	19.432	200	38.62	40	48.151	159	23.32	184	30.050	156	48.18	350
18.9	12.761	201	49.30	294	19.632	248	38.22	10	48.310	200	21.48	198	30.206	217	44.68	342
28.9	12.962	242	46.36	289	19.880	287	38.12	— 22	48.510	234	19.50	207	30.423	272	41.26	326
June 7.9	13.204	276	43.47	276	20.167	321	38.34	51	48.744	265	17.43	213	30.695	320	38.00	300
17.9	13.480	304	40.71	255	20.488	346	38.85	82	49.009	288	15.30	210	31.015	362	35.00	270
27.8	13.784	323	38.16	231	20.834	362	39.67	110	49.297	304	13.20	205	31.377	392	32.30	230
July 7.8	14.107	334	35.85	196	21.196	369	40.77	133	49.601	311	11.15	193	31.769	411	30.00	186
17.8	14.441	337	33.89	159	21.565	368	42.10	154	49.912	313	9.22	176	32.180	420	28.14	135
27.7	14.778	332	32.30	116	21.933	359	43.64	172	50.225	305	7.46	153	32.600	418	26.79	81
Aug. 6.7	15.110	318	31.14	71	22.292	342	45.36	183	50.530	292	5.93	126	33.018	404	25.98	24
16.7	15.428	297	30.43	23	22.634	322	47.19	192	50.822	274	4.67	98	33.422	380	25.74	— 32
26.7	15.725	270	30.20	— 24	22.956	295	49.11	195	51.096	250	3.69	65	33.802	347	26.06	91
Sept. 5.6	15.995	239	30.44	71	23.251	265	51.06	196	51.346	223	3.04	32	34.149	304	26.97	143
15.6	16.234	203	31.15	115	23.516	234	53.02	192	51.569	194	2.72	2	34.453	256	28.40	189
25.6	16.437	165	32.30	151	23.750	199	54.94	185	51.763	163	2.70	— 29	34.709	201	30.29	231
Oct. 5.6	16.602	126	33.81	183	23.949	164	56.79	175	51.926	133	2.99	56	34.910	145	32.60	263
15.5	16.728	87	35.64	207	24.113	129	58.54	163	52.059	100	3.55	79	35.055	85	35.23	284
25.5	16.815	49	37.71	221	24.242	95	60.17	149	52.159	70	4.34	96	35.140	27	38.07	295
Nov. 4.5	16.864	10	39.92	226	24.337	59	61.66	132	52.229	41	5.30	109	35.167	— 30	41.02	295
14.4	16.874	— 25	42.18	223	24.396	23	62.98	112	52.270	10	6.39	117	35.137	84	43.97	280
24.4	16.849	59	44.41	209	24.419	— 12	64.10	92	52.280	— 17	7.56	119	35.053	134	46.77	258
Dec. 4.4	16.790	88	46.50	190	24.407	45	65.02	69	52.263	44	8.75	114	34.919	179	49.35	225
14.4	16.702	117	48.40	162	24.362	78	65.71	45	52.219	69	9.89	108	34.740	217	51.60	182
24.3	16.585	139	50.02	128	24.284	109	66.16	17	52.150	91	10.97	97	34.523	250	53.42	136
34.3	16.446		51.30		24.175		66.33		52.059		11.94		34.273		54.78	
Mean Place	12.269		63.96		18.931		33.48		47.543		31.69		30.414		62.59	
Sec δ, Tan δ	1.168		−0.604		1.199		+0.661		1.007		−0.119		1.620		−1.275	
$D_\psi \alpha$, $D_\omega \alpha$	+0.05		+0.03		+0.07		−0.04		+0.06		+0.01		+0.04		+0.07	
$D_\psi \delta$, $D_\omega \delta$	+0.3		+0.5		+0.3		+0.5		+0.3		+0.5		+0.3		+0.6	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	*o* Ceti. (*Mira.*) Var. 1.7–9.6				*κ* Fornacis. Mag. 5.4				*δ* Hydri. Mag. 4.3				*ι* Cassiopeiæ. Mag. 4.6			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 2 15		° ′ − 3 21		h m 2 18		° ′ −24 11		h m 2 20		° ′ −69 1		h m 2 22		° ′ +67 1	
	s		″		s		″		s		″		s		″	
Jan. 0.3	7.526	98	25.26	81	43.417	127	52.98	109	17.71	54	98.99	92	9.81	36	55.88	115
10.3	7.428	115	26.07	69	43.290	144	54.07	76	17.17	57	99.91	31 —	9.45	41	57.03	60
20.3	7.313	128	26.76	57	43.146	156	54.83	42	16.60	59	100.22	29	9.04	44	57.63	6 —
30.2	7.185	135	27.33	40	42.990	162	55.25	5 —	16.01	58	99.93	88	8.60	45	57.69	49
Feb. 9.2	7.050	133	27.73	25	42.828	161	55.30	30	15.43	56	99.05	145	8.15	44	57.20	100
19.2	6.917	126	27.98	4 —	42.667	151	55.00	66	14.87	52	97.60	196	7.71	41	56.20	150
29.2	6.791	108	28.02	14	42.516	133	54.34	99	14.35	47	95.64	242	7.30	35	54.70	188
Mar. 10.1	6.683	85	27.88	36	42.383	108	53.35	134	13.88	41	93.22	282	6.95	29	52.82	223
20.1	6.598	53	27.52	58	42.275	75	52.01	164	13.47	32	90.40	314	6.66	19	50.59	243
30.1	6.545	15 —	26.94	80	42.200	36 —	50.37	190	13.15	24	87.26	342	6.47	10 —	48.16	259
Apr. 9.0	6.530	25	26.14	104	42.164	6	48.47	217	12.91	15	83.84	360	6.37	1	45.57	259
19.0	6.555	70	25.10	126	42.170	53	46.30	237	12.76	4 —	80.24	372	6.38	12	42.98	253
29.0	6.625	115	23.84	146	42.223	100	43.93	255	12.72	7	76.52	374	6.50	23	40.45	235
May 9.0	6.740	158	22.38	165	42.323	147	41.38	265	12.79	16	72.78	367	6.73	34	38.10	208
18.9	6.898	199	20.73	182	42.470	189	38.73	270	12.95	27	69.11	354	7.07	42	36.02	175
28.9	7.097	235	18.91	192	42.659	230	36.03	270	13.22	36	65.57	332	7.49	51	34.27	138
June 7.9	7.332	265	16.99	200	42.889	264	33.33	263	13.58	44	62.25	300	8.00	58	32.89	98
17.9	7.597	287	14.99	203	43.153	290	30.70	249	14.02	51	59.25	264	8.58	63	31.91	49
27.8	7.884	303	12.96	198	43.443	311	28.21	229	14.53	58	56.61	219	9.21	67	31.42	4 —
July 7.8	8.187	311	10.98	188	43.754	321	25.92	202	15.11	61	54.42	170	9.88	69	31.38	42
17.8	8.498	313	9.10	175	44.075	324	23.90	169	15.72	64	52.72	114	10.57	69	31.80	89
27.7	8.811	305	7.35	157	44.399	320	22.21	133	16.36	65	51.58	54 —	11.26	68	32.69	129
Aug. 6.7	9.116	292	5.78	134	44.719	308	20.88	92	17.01	63	51.04	6	11.94	67	33.98	170
16.7	9.408	273	4.44	107	45.027	290	19.96	49	17.64	60	51.10	63	12.61	62	35.68	207
26.7	9.681	251	3.37	77	45.317	265	19.47	4 —	18.24	55	51.73	127	13.23	58	37.75	237
Sept. 5.6	9.932	226	2.60	48	45.582	238	19.43	39	18.79	49	53.00	180	13.81	53	40.12	264
15.6	10.158	195	2.12	18 —	45.820	205	19.82	81	19.28	40	54.80	228	14.34	47	42.76	287
25.6	10.353	166	1.94	11	46.025	171	20.63	119	19.68	31	57.08	269	14.81	40	45.63	301
Oct. 5.6	10.519	136	2.05	37	46.196	136	21.82	149	19.99	20	59.77	300	15.21	33	48.64	313
15.5	10.655	105	2.42	59	46.332	99	23.31	175	20.19	10 —	62.77	317	15.54	25	51.77	317
25.5	10.760	74	3.01	78	46.431	65	25.06	191	20.29	1	65.94	325	15.79	17	54.94	312
Nov. 4.5	10.834	44	3.79	90	46.496	29 —	26.97	200	20.28	11	69.19	319	15.96	8	58.06	302
14.4	10.878	15 —	4.69	99	46.525	3	28.97	201	20.17	22	72.38	301	16.04	0	61.08	284
24.4	10.893	13	5.68	103	46.522	36	30.98	193	19.95	31	75.39	270	16.04	9	63.92	261
Dec. 4.4	10.880	38	6.71	103	46.486	65	32.91	178	19.64	40	78.09	232	15.95	17	66.53	228
14.4	10.842	65	7.74	97	46.421	92	34.69	157	19.24	46	80.41	183	15.78	25	68.81	189
24.3	10.777	87	8.71	91	46.329	117	36.26	129	18.78	52	82.24	130	15.53	32	70.70	142
34.3	10.690		9.62		46.212		37.55		18.26		83.54		15.21		72.12	
Mean Place	6.121		30.26		41.901		51.70		14.958		88.91		7.604		32.18	
Sec δ, Tan δ	1.002		−0.059		1.096		−0.449		2.795		−2.610		2.562		+2.359	
$D_\psi \alpha$, $D_\omega \alpha$	+0.06		0.00		+0.05		+0.02		+0.02		+0.14		+0.10		−0.13	
$D_\psi \delta$, $D_\omega \delta$	+0.3		*+0.6*		*+0.3*		+0.6		+0.3		+0.6		+0.3		+0.6	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ξ² Ceti. Mag. 4.3				σ Ceti. Mag. 4.8				36 H. Cassiopeiæ. Mag. 5.3				ν Ceti. Mag. 5.0			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	2 23		+ 8 5		2 28		−15 36		2 29		+72 27		2 31		+ 5 13	
	s		″		s		″		s		″		s		″	
Jan. 0.3	42.870		11.68		7.787		43.97		63.78		30.92		29.301		46.36	
		91		59		108		105		48		138		90		67
10.3	42.779		11.09		7.679		45.02		63.30		32.30		29.211		45.69	
		112		59		128		81		54		84		110		63
20.3	42.667		10.50		7.551		45.83		62.76		33.14		29.101		45.06	
		126		58		141		55		60		27		127		58
30.2	42.541		9.92		7.410		46.38		62.16		33.41	—	28.974		44.48	
		135		55		150		27		61		31		134		52
Feb. 9.2	42.406		9.37		7.260		46.65	—	61.55		33.10		28.840		43.96	
		136		49		150		3		60		88		137		44
19.2	42.270		8.88		7.110		46.62		60.95		32.22		28.703		43.52	
		129		42		143		32		55		140		132		32
29.2	42.141		8.46		6.967		46.30		60.40		30.82		28.571		43.20	
		112		32		128		61		50		185		119		19
Mar. 10.1	42.029		8.14		6.839		45.69		59.90		28.97		28.452		43.01	
		90		18		105		89		40		223		95		6
20.1	41.939		7.96		6.734		44.80		59.50		26.74		28.357		42.95	—
		57		3		74		118		30		252		62		12
30.1	41.882		7.93	—	6.660		43.62		59.20		24.22		28.295		43.07	
		19		16		37		144		17		268		27		30
Apr. 9.1	41.863	—	8.09		6.623	—	42.18		59.03		21.54		28.268	—	43.37	
		23		35		4		170		2		275		14		51
19.0	41.886		8.44		6.627		40.48		59.01	—	18.79		28.282		43.88	
		68		56		49		191		11		270		59		73
29.0	41.954		9.00		6.676		38.57		59.12		16.09		28.341		44.61	
		115		80		95		211		25		256		104		94
May 9.0	42.069		9.80		6.771		36.46		59.37		13.53		28.445		45.55	
		158		100		140		226		40		234		149		116
18.9	42.227		10.80		6.911		34.20		59.77		11.19		28.594		46.71	
		201		122		182		235		50		202		190		133
28.9	42.428		12.02		7.093		31.85		60.27		9.17		28.784		48.04	
		236		139		222		242		62		165		229		150
June 7.9	42.664		13.41		7.315		29.43		60.89		7.52		29.013		49.54	
		268		154		253		239		70		123		260		165
17.9	42.932		14.95		7.568		27.04		61.59		6.29		29.273		51.19	
		290		166		278		233		77		78		283		171
27.8	43.222		16.61		7.846		24.71		62.36		5.51		29.556		52.90	
		309		172		301		221		83		30		303		176
July 7.8	43.531		18.33		8.147		22.50		63.19		5.21	—	29.859		54.66	
		316		173		310		201		87		18		313		175
17.8	43.847		20.06		8.457		20.49		64.06		5.39		30.172		56.41	
		317		171		314		175		88		65		314		171
27.8	44.164		21.77		8.771		18.74		64.94		6.04		30.486		58.12	
		312		162		310		147		86		111		310		158
Aug. 6.7	44.476		23.39		9.081		17.27		65.80		7.15		30.796		59.70	
		299		151		300		113		84		154		299		145
16.7	44.775		24.90		9.381		16.14		66.64		8.69		31.095		61.15	
		283		135		282		75		80		194		284		128
26.7	45.058		26.25		9.663		15.39		67.44		10.63		31.379		62.43	
		260		116		262		37		75		229		263		104
Sept. 5.6	45.318		27.41		9.925		15.02	—	68.19		12.92		31.642		63.47	
		236		95		236		2		69		261		239		82
15.6	45.554		28.36		10.161		15.04		68.88		15.53		31.881		64.29	
		208		72		208		41		62		286		211		57
25.6	45.762		29.08		10.369		15.45		69.50		18.39		32.092		64.86	
		180		50		177		74		52		307		184		33
Oct. 5.6	45.942		29.58		10.546		16.19		70.02		21.46		32.276		65.19	
		149		28		144		106		44		321		156		10
15.5	46.091		29.86		10.690		17.25		70.46		24.67		32.432		65.29	—
		120		9		112		131		33		329		125		10
25.5	46.211		29.95	—	10.802		18.56		70.79		27.96		32.557		65.19	
		90		9		80		148		22		329		96		29
Nov. 4.5	46.301		29.86		10.882		20.04		71.01		31.25		32.653		64.90	
		60		24		47		162		12		323		66		43
14.5	46.361		29.62		10.929		21.66		71.13		34.48		32.719		64.47	
		30		36		16		166		0		307		35		56
24.4	46.391		29.26		10.945	—	23.32		71.13		37.55		32.754		63.91	
		3		46		15		165		12		285		8		62
Dec. 4.4	46.394	—	28.80		10.930		24.97		71.01		40.40		32.762	—	63.29	
		27		53		44		155		23		253		23		68
14.4	46.367		28.27		10.886		26.52		70.78		42.93		32.739		62.61	
		54		57		71		140		33		214		50		69
24.3	46.313		27.70		10.815		27.92		70.45		45.07		32.689		61.92	
		81		61		97		121		43		168		77		70
34.3	46.232		27.09		10.718		29.13		70.02		46.75		32.612		61.22	
Mean Place	41.431		2.97		6.275		45.35		60.986		6.78		27.821		38.55	
Sec δ, Tan δ	1.010		+0.142		1.038		−0.279		3.318		+3.164		1.004		+0.092	
$D_\psi a$, $D_\omega a$	+0.06		−0.01		+0.06		+0.01		+0.11		−0.17		+0.06		−0.01	
$D_\psi \delta$, $D_\omega \delta$	+0.3		+0.6		+0.3		+0.6		+0.3		+0.6		+0.3		+0.6	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	μ Hydri. Mag. 5.3				ν Arietis. Mag. 5.4				δ Ceti. Mag. 4.0				ε Hydri. Mag. 4.3			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	2 33		−79 27		2 34		+21 35		2 35		− 0 1		2 38		−68 36	
	s		″		s		″		s		″		s		″	
Jan. 0.3	29.92		103.95		4.131		68.43		12.038		53.19		20.42		105.45	
10.3	28.75	117	104.86	91	4.038	93	68.21	22	11.949	89	53.99	80	19.90	52	106.63	118
20.3	27.52	123	105.17	31	3.920	118	67.87	34	11.838	111	54.68	69	19.34	56	107.22	59
30.2	26.26	126	104.88	29	3.785	135	67.39	48	11.712	126	55.28	60	18.76	58	107.20	2
Feb. 9.2	25.01	125	104.00	88	3.638	147	66.80	59	11.575	137	55.76	48	18.18	58	106.60	60
19.2	23.80	121	102.54	146	3.489	149	66.10	70	11.435	140	56.09	33	17.61	57	105.43	117
29.2	22.66	114	100.57	197	3.345	144	65.35	75	11.301	134	56.26	17	17.07	54	103.73	170
Mar. 10.1	21.61	105	98.14	243	3.217	128	64.57	78	11.180	121	56.28	2	16.57	50	101.54	219
20.1	20.70	91	95.32	282	3.114	103	63.81	76	11.081	99	56.09	19	16.13	44	98.92	262
30.1	19.92	78	92.16	316	3.045	69	63.12	69	11.012	69	55.72	37	15.77	36	95.94	298
Apr. 9.1	19.31	61	88.76	340	3.016	29	62.52	60	10.980	32	55.13	59	15.48	29	92.67	327
19.0	18.89	42	85.16	360	3.033	17	62.07	45	10.988	8	54.32	81	15.30	18	89.17	350
29.0	18.64	25	81.46	370	3.098	65	61.81	26	11.040	52	53.29	103	15.21	9	85.52	365
May 9.0	18.60	4	77.75	371	3.212	114	61.76	5	11.138	98	52.05	124	15.22	1	81.81	371
18.9	18.75	15	74.09	366	3.374	162	61.96	20	11.279	141	50.61	144	15.33	11	78.12	369
28.9	19.09	34	70.58	351	3.581	207	62.39	43	11.463	184	49.00	161	15.56	23	74.54	358
June 7.9	19.63	54	67.29	329	3.827	246	63.07	68	11.685	222	47.27	173	15.87	31	71.13	341
17.9	20.32	69	64.31	298	4.106	279	63.96	89	11.939	254	45.43	184	16.27	40	67.99	314
27.8	21.16	84	61.71	260	4.412	306	65.08	112	12.217	278	43.54	189	16.74	47	65.19	280
July 7.8	22.13	97	59.54	217	4.736	324	66.36	128	12.513	296	41.66	188	17.28	54	62.82	237
17.8	23.21	108	57.89	165	5.070	334	67.78	142	12.823	310	39.82	184	17.86	58	60.94	188
27.8	24.35	114	56.79	110	5.406	336	69.30	152	13.134	311	38.09	173	18.48	62	59.59	135
Aug. 6.7	25.52	117	56.29	50	5.738	332	70.88	158	13.441	307	36.52	157	19.12	64	58.82	77
16.7	26.69	117	56.38	9	6.060	322	72.48	160	13.740	299	35.14	138	19.75	63	58.66	16
26.7	27.81	112	57.08	70	6.363	303	74.05	157	14.023	283	34.00	114	20.35	60	59.12	46
Sept. 5.6	28.84	103	58.38	130	6.647	284	75.55	150	14.285	262	33.11	89	20.92	57	60.17	105
15.6	29.77	93	60.22	184	6.905	258	76.97	142	14.525	240	32.52	59	21.43	51	61.79	162
25.6	30.55	78	62.55	233	7.137	232	78.27	130	14.737	212	32.20	32	21.86	43	63.93	214
Oct. 5.6	31.14	59	65.28	273	7.339	202	79.43	116	14.923	186	32.15	5	22.20	34	66.51	258
15.5	31.55	41	68.33	305	7.511	172	80.45	102	15.078	155	32.36	21	22.44	24	69.44	293
25.5	31.72	17	71.55	322	7.653	142	81.33	88	15.204	126	32.78	42	22.59	15	72.60	316
Nov. 4.5	31.69	3	74.85	330	7.763	110	82.04	71	15.301	97	33.39	61	22.63	4	75.88	328
14.5	31.43	26	78.08	323	7.841	78	82.61	57	15.367	66	34.15	76	22.57	6	79.14	326
24.4	30.96	47	81.13	305	7.889	48	83.04	43	15.403	36	35.01	86	22.40	17	82.27	313
Dec. 4.4	30.28	68	83.88	275	7.903	14	83.32	28	15.411	8	35.92	91	22.12	28	85.15	288
14.4	29.43	85	86.23	235	7.883	20	83.45	13	15.388	23	36.84	92	21.77	35	87.66	251
24.3	28.43	100	88.08	185	7.834	49	83.45	0	15.338	50	37.74	90	21.34	43	89.73	207
34.3	27.31	112	89.39	131	7.755	79	83.31	14	15.261	77	38.60	86	20.85	49	91.27	154
Mean Place	25.067		93.79		2.605		55.63		10.534		59.38		17.548		96.20	
Sec δ, Tan δ	5.473		−5.382		1.076		+0.396		1.000		−0.001		2.744		−2.555	
$D_\psi a$, $D_\omega a$	−0.03		+0.28		+0.07		−0.02		+0.06		0.00		+0.02		+0.13	
$D_\psi \delta$, $D_\omega \delta$	+0.3		+0.6		+0.3		+0.6		+0.3		+0.6		+0.3		+0.6	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	θ Persei. Mag. 4.2				γ Ceti seq. Mag. 3.7				π Ceti. Mag. 4.4				μ Ceti. Mag. 4.4			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 2 38		° ′ +48 52		h m 2 38		° ′ + 2 52		h m 2 40		° ′ −14 12		h m 2 40		° ′ + 9 45	
	s		″		s		″		s		″		s		″	
Jan. 0.3	29.105	158	46.24	70	58.289	86	63.78	72	8.978	100	47.87	109	25.447	84	45.96	54
10.3	28.947	193	46.94	32	58.203	108	63.06	67	8.878	124	48.96	87	25.363	107	45.42	56
20.3	28.754	219	47.26	— 8	58.095	126	62.39	60	8.754	139	49.83	61	25.256	126	44.86	55
30.3	28.535	234	47.18	47	57.969	137	61.79	50	8.615	150	50.44	33	25.130	137	44.31	54
Feb. 9.2	28.301	237	46.71	86	57.832	141	61.29	40	8.465	152	50.77	7	24.993	142	43.77	50
19.2	28.064	226	45.85	119	57.691	135	60.89	26	8.313	148	50.84	— 23	24.851	137	43.27	45
29.2	27.838	201	44.66	148	57.556	122	60.63	12	8.165	135	50.61	50	24.714	123	42.82	37
Mar. 10.1	27.637	164	43.18	170	57.434	102	60.51	— 4	8.030	112	50.11	80	24.591	101	42.45	25
20.1	27.473	115	41.48	183	57.332	71	60.55	23	7.918	83	49.31	107	24.490	71	42.20	12
30.1	27.358	59	39.65	190	57.261	35	60.78	42	7.835	48	48.24	133	24.419	34	42.08	— 5
Apr. 9.1	27.299	— 8	37.75	187	57.226	— 5	61.20	63	7.787	7	46.91	159	24.385	— 8	42.13	24
19.0	27.307	73	35.88	178	57.231	50	61.83	84	7.780	— 38	45.32	181	24.393	53	42.37	43
29.0	27.380	143	34.10	158	57.281	96	62.67	106	7.818	84	43.51	201	24.446	100	42.80	65
May 9.0	27.523	207	32.52	136	57.377	139	63.73	126	7.902	129	41.50	217	24.546	145	43.45	86
19.0	27.730	268	31.16	106	57.516	183	64.99	143	8.031	172	39.33	228	24.691	188	44.31	106
28.9	27.998	321	30.10	73	57.699	220	66.42	160	8.203	211	37.05	235	24.879	226	45.37	125
June 7.9	28.319	368	29.37	39	57.919	253	68.02	169	8.414	245	34.70	236	25.105	259	46.62	140
17.9	28.687	403	28.98	3	58.172	278	69.71	178	8.659	272	32.34	231	25.364	285	48.02	153
27.8	29.090	427	28.95	— 35	58.450	297	71.49	180	8.931	293	30.03	218	25.649	304	49.55	161
July 7.8	29.517	445	29.30	69	58.747	309	73.29	177	9.224	307	27.85	202	25.953	315	51.16	165
17.8	29.962	449	29.99	101	59.056	312	75.06	169	9.531	311	25.83	180	26.268	318	52.81	162
27.8	30.411	444	31.00	133	59.368	310	76.75	157	9.842	310	24.03	150	26.586	315	54.43	157
Aug. 6.7	30.855	432	32.33	160	59.678	299	78.32	141	10.152	301	22.53	118	26.901	306	56.00	148
16.7	31.287	413	33.93	182	59.977	285	79.73	119	10.453	287	21.35	81	27.207	291	57.48	133
26.7	31.700	385	35.75	200	60.262	265	80.92	97	10.740	266	20.54	45	27.498	272	58.81	115
Sept. 5.7	32.085	355	37.75	217	60.527	243	81.89	70	11.006	245	20.09	6	27.770	248	59.96	97
15.6	32.440	319	39.92	226	60.770	217	82.59	45	11.251	216	20.03	— 33	28.018	223	60.93	75
25.6	32.759	283	42.18	233	60.987	189	83.04	19	11.467	187	20.36	67	28.241	197	61.68	54
Oct. 5.6	33.042	240	44.51	235	61.176	160	83.23	— 5	11.654	156	21.03	98	28.438	167	62.22	34
15.5	33.282	197	46.86	234	61.336	132	83.18	27	11.810	125	22.01	125	28.605	139	62.56	14
25.5	33.479	151	49.20	226	61.468	101	82.91	45	11.935	93	23.26	144	28.744	108	62.70	— 3
Nov. 4.5	33.630	104	51.46	216	61.569	71	82.46	59	12.028	61	24.70	157	28.852	78	62.67	18
14.5	33.734	57	53.62	200	61.640	43	81.87	71	12.089	28	26.27	163	28.930	49	62.49	30
24.4	33.791	6	55.62	180	61.683	11	81.16	78	12.117	— 2	27.90	163	28.979	17	62.19	39
Dec. 4.4	33.797	— 43	57.42	155	61.694	— 18	80.38	80	12.115	33	29.53	155	28.996	— 13	61.80	46
14.4	33.754	91	58.97	125	61.676	46	79.58	81	12.082	62	31.08	143	28.983	42	61.34	52
24.4	33.663	135	60.22	91	61.630	74	78.77	78	12.020	88	32.51	124	28.941	71	60.82	55
34.3	33.528		61.13		61.556		77.99		11.932		33.75		28.870		60.27	
Mean Place	27.276		26.40		56.770		56.70		7.415		49.84		23.914		36.78	
Sec δ, Tan δ	1.520		+1.146		1.001		+0.050		1.031		−0.253		1.015		+0.172	
$D_\psi a$, $D_\omega a$	+0.08		−0.06		+0.06		0.00		+0.06		+0.01		+0.06		−0.01	
$D_\psi \delta$, $D_\omega \delta$	+0.3		+0.6		+0.3		+0.6		+0.3		+0.6		+0.3		+0.6	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	η Persei. Mag. 3.9				41 Arietis. Mag. 3.7				β Fornacis. Mag. 4.5				σ Arietis. Mag. 5.5			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	2 44		+55 32		2 45		+26 54		2 45		−32 44		2 46		+14 44	
	s		″		s		″		s		″		s		″	
Jan. 0.3	35.645		73.00		3.732		68.35		36.222		92.59		52.697		22.00	
10.3	35.451	194	73.98	98	3.639	93	68.35	0	36.079	143	93.97	138	52.615	82	21.60	40
20.3	35.216	235	74.54	56	3.518	121	68.15	20	35.912	167	94.95	98	52.507	108	21.14	46
30.3	34.949	267	74.64	10	3.376	142	67.79	36	35.728	184	95.51	56	52.380	127	20.65	49
Feb. 9.2	34.664	285	74.30	— 34	3.220	156	67.25	54	35.534	194	95.63	12	52.239	141	20.11	54
19.2	34.375	289	73.51	79	3.060	160	66.55	70	35.338	196	95.33	— 30	52.094	145	19.54	57
29.2	34.098	277	72.33	118	2.903	157	65.73	82	35.147	191	94.60	73	51.951	143	18.99	55
Mar. 10.1	33.850	248	70.79	154	2.761	142	64.83	90	34.972	175	93.46	114	51.821	130	18.48	51
20.1	33.643	207	68.98	181	2.645	116	63.89	94	34.821	151	91.94	152	51.714	107	18.03	45
30.1	33.492	151	66.97	201	2.563	82	62.96	93	34.702	119	90.08	186	51.637	77	17.66	37
Apr. 9.1	33.408	84	64.84	213	2.522	41	62.10	86	34.622	80	87.89	219	51.598	39	17.45	21
19.0	33.396	12	62.69	215	2.528	— 6	61.35	75	34.588	34	85.42	247	51.599	— 1	17.38	7
29.0	33.462	— 66	60.62	207	2.584	56	60.76	59	34.601	— 13	82.74	268	51.648	49	17.51	— 13
May 9.0	33.607	145	58.69	193	2.692	108	60.36	40	34.664	63	79.88	286	51.745	97	17.86	35
19.0	33.826	219	56.98	171	2.849	157	60.20	16	34.778	114	76.91	297	51.886	141	18.40	54
28.9	34.117	291	55.55	143	3.054	205	60.28	— 8	34.941	163	73.90	301	52.073	187	19.17	77
June 7.9	34.469	352	54.45	110	3.301	247	60.62	34	35.148	207	70.91	299	52.299	226	20.13	96
17.9	34.875	406	53.72	73	3.583	282	61.20	58	35.396	248	68.01	290	52.559	260	21.29	116
27.8	35.324	449	53.38	34	3.894	311	62.02	82	35.676	280	65.28	273	52.845	286	22.59	130
July 7.8	35.805	481	53.41	— 3	4.226	332	63.05	103	35.983	307	62.81	247	53.153	308	24.00	141
17.8	36.305	500	53.84	43	4.569	343	64.27	122	36.307	324	60.64	217	53.472	319	25.48	148
27.8	36.813	508	54.65	81	4.918	349	65.63	136	36.641	334	58.84	180	53.795	323	27.04	156
Aug. 6.7	37.318	505	55.81	116	5.263	345	67.10	147	36.977	336	57.47	137	54.117	322	28.57	153
16.7	37.811	493	57.29	148	5.600	337	68.64	154	37.307	330	56.56	91	54.430	313	30.05	148
26.7	38.284	473	59.07	178	5.921	321	70.21	157	37.622	315	56.15	41	54.728	298	31.44	139
Sept. 5.7	38.729	445	61.10	203	6.221	300	71.77	156	37.916	294	56.24	— 9	55.007	279	32.72	128
15.6	39.140	411	63.32	222	6.498	277	73.29	152	38.184	268	56.83	59	55.264	257	33.82	110
25.6	39.512	372	65.71	239	6.748	250	74.75	146	38.422	238	57.90	107	55.497	233	34.78	96
Oct. 5.6	39.840	328	68.21	250	6.970	222	76.11	136	38.626	204	59.40	150	55.702	205	35.55	77
15.5	40.121	281	70.80	259	7.162	192	77.37	126	38.791	165	61.25	185	55.881	179	36.14	59
25.5	40.351	230	73.41	261	7.321	159	78.50	113	38.919	128	63.41	216	56.029	148	36.57	43
Nov. 4.5	40.528	177	75.97	256	7.449	128	79.51	101	39.008	89	65.75	234	56.146	117	36.82	25
14.5	40.649	121	78.46	249	7.545	96	80.39	88	39.057	49	68.21	246	56.235	89	36.94	12
24.4	40.713	64	80.81	235	7.605	60	81.12	73	39.067	10	70.68	247	56.291	56	36.92	— 2
Dec. 4.4	40.716	3	82.95	214	7.631	26	81.71	59	39.038	— 29	73.06	238	56.315	24	36.81	11
14.4	40.662	— 54	84.85	190	7.621	— 10	82.13	42	38.974	64	75.25	219	56.309	— 6	36.59	22
24.4	40.550	112	86.42	157	7.577	44	82.39	26	38.876	98	77.20	195	56.272	37	36.28	31
34.3	40.384	166	87.64	122	7.500	77	82.48	9	38.746	130	78.82	162	56.202	70	35.91	37
Mean Place	33.586		52.02		2.107		54.20		34.504		89.75		51.120		11.38	
Sec δ, Tan δ	1.768		+1.458		1.122		+0.508		1.189		−0.643		1.034		+0.263	
Dψ α, Dω α	+0.09		−0.07		+0.07		−0.03		+0.05		+0.03		+0.07		−0.01	
Dψ δ, Dω δ	+0.3		*+0.7*		*+0.3*		*+0.7*		+0.3		+0.7		+0.3		+0.7	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	*τ*² Eridani. Mag. 4.8				*τ* Persei. Mag. 4.1				*η* Eridani. Mag. 4.0				*ε* Arietis (*mean*). Mag. 4.6			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 2 47		° ′ −21 20		h m 2 48		° ′ +52 25		h m 2 52		° ′ − 9 13		h m 2 54		° ′ +21 0	
	s		″		s		″		s		″		s		″	
Jan. 0.3	15.245		58.43		19.589		30.80		21.002		50.96		25.959		30.49	
10.3	15.133	112	59.69	126	19.419	170	31.71	91	20.913	89	52.02	106	25.876	83	30.32	17
20.3	14.999	134	60.65	96	19.209	210	32.22	51	20.799	114	52.90	88	25.766	110	30.01	31
30.3	14.847	152	61.29	64	18.969	240	32.30	8	20.666	133	53.57	67	25.634	132	29.61	40
Feb. 9.2	14.683	164	61.58	29	18.709	260	31.96	—34	20.521	145	54.02	45	25.488	146	29.10	51
19.2	14.516	167	61.54	—4	18.444	265	31.21	75	20.371	150	54.23	21	25.334	154	28.51	59
29.2	14.354	162	61.15	39	18.190	254	30.08	113	20.223	148	54.20	—3	25.183	151	27.84	67
Mar. 10.2	14.204	150	60.41	74	17.959	231	28.63	145	20.086	137	53.91	29	25.042	141	27.18	66
20.1	14.076	128	59.35	106	17.767	192	26.91	172	19.970	116	53.38	53	24.926	116	26.50	68
30.1	13.977	99	57.99	136	17.626	141	25.02	189	19.881	89	52.60	78	24.840	86	25.85	65
Apr. 9.1	13.914	63	56.33	166	17.546	80	23.02	200	19.827	54	51.57	103	24.793	47	25.31	54
19.0	13.893	21	54.41	192	17.533	13	21.01	201	19.813	14	50.28	129	24.789	4	24.88	43
29.0	13.918	—25	52.24	217	17.593	—60	19.07	194	19.843	—30	48.78	150	24.832	—43	24.63	25
May 9.0	13.989	71	49.90	234	17.727	134	17.28	179	19.918	75	47.07	171	24.926	94	24.57	6
19.0	14.107	118	47.41	249	17.930	203	15.71	157	20.038	120	45.19	188	25.067	141	24.73	—16
28.9	14.269	162	44.81	260	18.200	270	14.41	130	20.201	163	43.17	202	25.254	187	25.11	38
June 7.9	14.473	204	42.19	262	18.529	329	13.42	99	20.404	203	41.04	213	25.483	229	25.69	58
17.9	14.713	240	39.61	258	18.909	380	12.79	63	20.641	237	38.88	216	25.747	264	26.51	82
27.9	14.983	270	37.11	250	19.328	419	12.53	26	20.906	265	36.73	215	26.039	292	27.51	100
July 7.8	15.275	292	34.78	233	19.777	449	12.65	—12	21.193	287	34.65	208	26.354	315	28.69	118
17.8	15.583	308	32.68	210	20.245	468	13.12	47	21.495	302	32.69	196	26.681	327	29.98	129
27.8	15.899	316	30.85	183	20.721	476	13.95	83	21.803	308	30.91	178	27.015	334	31.39	141
Aug. 6.7	16.215	316	29.38	147	21.196	475	15.11	116	22.110	307	29.38	153	27.348	333	32.84	145
16.7	16.523	308	28.29	109	21.661	465	16.56	145	22.410	300	28.12	126	27.674	326	34.30	146
26.7	16.819	296	27.61	68	22.106	445	18.28	172	22.699	289	27.18	94	27.983	309	35.74	144
Sept. 5.7	17.096	277	27.37	24	22.527	421	20.23	195	22.971	272	26.58	60	28.277	294	37.12	138
15.6	17.348	252	27.56	—19	22.916	389	22.36	213	23.220	249	26.33	25	28.549	272	38.40	128
25.6	17.574	226	28.18	62	23.268	352	24.63	227	23.444	224	26.44	—11	28.796	247	39.57	117
Oct. 5.6	17.769	195	29.17	99	23.581	313	27.01	238	23.642	198	26.86	42	29.016	220	40.61	104
15.6	17.932	163	30.52	135	23.851	270	29.44	243	23.810	168	27.60	74	29.209	193	41.52	91
25.5	18.061	129	32.15	163	24.075	224	31.89	245	23.949	139	28.59	99	29.371	162	42.27	75
Nov. 4.5	18.158	97	33.98	183	24.251	176	34.30	241	24.057	108	29.79	120	29.502	131	42.90	63
14.5	18.220	62	35.94	196	24.375	124	36.63	233	24.134	77	31.13	134	29.603	101	43.39	49
24.4	18.247	27	37.94	200	24.445	70	38.81	218	24.180	46	32.55	142	29.670	67	43.75	36
Dec. 4.4	18.242	—5	39.91	197	24.461	16	40.82	201	24.194	14	33.99	144	29.704	34	43.98	23
14.4	18.203	39	41.77	186	24.422	—39	42.58	176	24.176	—18	35.40	141	29.705	1	44.10	12
24.4	18.133	70	43.44	167	24.328	94	44.05	147	24.130	46	36.72	132	29.672	—33	44.10	0
34.3	18.036	97	44.90	146	24.184	144	45.17	112	24.053	77	37.90	118	29.606	66	43.98	12
Mean Place	13.613		58.54		17.574		10.56		19.399		54.52		24.310		18.17	
Sec *δ*, Tan *δ*	1.074		−0.391		1.640		+1.299		1.013		−0.163		1.071		+0.384	
$D_\psi \alpha$, $D_\omega \alpha$	+0.05		+0.02		+0.08		−0.06		+0.06		+0.01		+0.07		−0.02	
$D_\psi \delta$, $D_\omega \delta$	+0.3		+0.7		+0.3		+0.7		+0.3		+0.7		+0.3		+0.7	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	47 H. Cephei. Mag. 5.7				θ Eridani. Mag. 3.4				α Ceti. Mag. 2.8				τ³ Eridani. Mag. 4.2			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	2 54		+79 5		2 55		−40 37		2 57		+ 3 45		2 58		−23 56	
	s		″		s		″		s		″		s		″	
Jan. 0.3	56.64	75	41.75	184	6.551	172	91.15	152	54.807	78	46.41	72	42.998	113	71.31	137
10.3	55.89	87	43.59	131	6.379	199	92.67	108	54.729	102	45.69	68	42.885	138	72.68	106
20.3	55.02	97	44.90	73	6.180	219	93.75	60	54.627	125	45.01	60	42.747	156	73.74	72
30.3	54.05	101	45.63	12	5.961	230	94.35	11	54.502	138	44.41	51	42.591	172	74.46	35
Feb. 9.2	53.04	103	45.75	50	5.731	233	94.46	38	54.364	145	43.90	42	42.419	178	74.81	1
19.2	52.01	98	45.25	107	5.498	228	94.08	84	54.219	144	43.48	28	42.241	173	74.80	38
29.2	51.03	89	44.18	160	5.270	212	93.24	129	54.075	133	43.20	16	42.068	162	74.42	76
Mar. 10.2	50.14	76	42.58	206	5.058	187	91.95	172	53.942	114	43.04	1	41.906	142	73.66	108
20.1	49.38	59	40.52	241	4.871	153	90.23	209	53.828	86	43.03	17	41.764	114	72.58	143
30.1	48.79	41	38.11	270	4.718	112	88.14	244	53.742	52	43.20	34	41.650	79	71.15	173
Apr. 9.1	48.38	20	35.41	284	4.606	65	85.70	271	53.690	12	43.54	55	41.571	35	69.42	201
19.0	48.18	2	32.57	289	4.541	13	82.99	293	53.678	32	44.09	76	41.536	8	67.41	224
29.0	48.20	25	29.68	284	4.528	43	80.06	312	53.710	80	44.85	96	41.544	57	65.17	243
May 9.0	48.45	44	26.84	266	4.571	100	76.94	322	53.790	124	45.81	116	41.601	104	62.74	259
19.0	48.89	66	24.18	244	4.671	151	73.72	326	53.914	167	46.97	134	41.705	150	60.15	267
28.9	49.55	83	21.74	210	4.822	201	70.46	320	54.081	206	48.31	148	41.855	192	57.48	272
June 7.9	50.38	99	19.64	172	5.023	246	67.26	306	54.287	240	49.79	162	42.047	232	54.76	268
17.9	51.37	112	17.92	129	5.269	284	64.20	288	54.527	269	51.41	169	42.279	263	52.08	256
27.9	52.49	123	16.63	84	5.553	316	61.32	258	54.796	289	53.10	172	42.542	288	49.52	240
July 7.8	53.72	129	15.79	35	5.869	338	58.74	224	55.085	304	54.82	171	42.830	305	47.12	217
17.8	55.01	134	15.44	14	6.207	354	56.50	182	55.389	310	56.53	163	43.135	316	44.95	185
27.8	56.35	135	15.58	62	6.561	357	54.68	135	55.699	311	58.16	154	43.451	318	43.10	151
Aug. 6.7	57.70	134	16.20	109	6.918	353	53.33	84	56.010	303	59.70	137	43.769	314	41.59	111
16.7	59.04	130	17.29	154	7.271	342	52.49	31	56.313	292	61.07	117	44.083	300	40.48	67
26.7	60.34	123	18.83	195	7.613	322	52.18	25	56.605	275	62.24	96	44.383	285	39.81	21
Sept. 5.7	61.57	116	20.78	231	7.935	293	52.43	79	56.880	255	63.20	70	44.668	262	39.60	24
15.6	62.73	105	23.09	266	8.228	262	53.22	130	57.135	231	63.90	45	44.930	236	39.84	68
25.6	63.78	93	25.75	293	8.490	224	54.52	176	57.366	205	64.35	19	45.166	207	40.52	110
Oct. 5.6	64.71	77	28.68	315	8.714	183	56.28	216	57.571	180	64.54	4	45.373	174	41.62	145
15.6	65.48	63	31.83	331	8.897	141	58.44	246	57.751	150	64.50	26	45.547	142	43.07	177
25.5	66.11	46	35.14	339	9.038	95	60.90	268	57.901	121	64.24	44	45.689	106	44.84	197
Nov. 4.5	66.57	27	38.53	340	9.133	50	63.58	278	58.022	93	63.80	59	45.795	72	46.81	213
14.5	66.84	9	41.93	333	9.183	5	66.36	278	58.115	60	63.21	71	45.867	35	48.94	216
24.4	66.93	11	45.26	317	9.188	39	69.14	267	58.175	30	62.50	76	45.902	1	51.10	213
Dec. 4.4	66.82	31	48.43	290	9.149	81	71.81	246	58.205	1	61.74	80	45.903	34	53.23	203
14.4	66.51	49	51.33	256	9.068	121	74.27	216	58.204	34	60.94	81	45.869	67	55.26	182
24.4	66.02	67	53.89	214	8.947	156	76.43	180	58.170	63	60.13	78	45.802	97	57.08	158
34.3	65.35		56.03		8.791		78.23		58.107		59.35		45.705		58.66	
Mean Place	51.755		18.03		4.687		86.84		53.189		39.08		41.300		70.96	
Sec δ, Tan δ	5.285		+5.190		1.317		−0.858		1.002		+0.066		1.094		−0.444	
$D_\psi \alpha$, $D_\omega \alpha$	+0.16		−0.25		+0.05		+0.04		+0.06		0.00		+0.05		+0.02	
$D_\psi \delta$, $D_\omega \delta$	+0.3		+0.7		+0.3		+0.7		+0.3		+0.7		+0.3		+0.7	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Persei. Mag. 3.1				ρ Persei. Var. 3.4–4.2				μ Horologii. Mag. 5.2				θ Hydri. Mag. 5.5			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 2 58		° ′ +53 10		h m 2 59		° ′ +38 30		h m 3 1		° ′ −60 3		h m 3 2		° ′ −72 13	
	s		″		s		″		s		″		s		″	
Jan. 0.3	44.358	164	62.48	102	49.129	105	72.63	49	40.22	33	54.16	158	7.71	62	58.13	147
10.3	44.194	209	63.50	63	49.024	139	73.12	20	39.89	37	55.74	105	7.09	68	59.60	88
20.3	43.985	241	64.13	20	48.885	168	73.32 —	8	39.52	39	56.79	47	6.41	72	60.48	30
30.3	43.744	265	64.33 —	22	48.717	185	73.24	38	39.13	41	57.26 —	10	5.69	73	60.78 —	30
Feb. 9.2	43.479	273	64.11	64	48.532	194	72.86	65	38.72	41	57.16	66	4.96	73	60.48	88
19.2	43.206	265	63.47	103	48.338	191	72.21	89	38.31	40	56.50	121	4.23	70	59.60	144
29.2	42.941	245	62.44	137	48.147	175	71.32	111	37.91	38	55.29	171	3.53	66	58.16	193
Mar. 10.2	42.696	207	61.07	165	47.972	150	70.21	126	37.53	34	53.58	218	2.87	60	56.23	239
20.1	42.489	157	59.42	185	47.822	112	68.95	135	37.19	28	51.40	258	2.27	52	53.84	278
30.1	42.332	96	57.57	198	47.710	66	67.60	139	36.91	23	48.82	293	1.75	42	51.06	312
Apr. 9.1	42.236	29	55.59	202	47.644	13	66.21	135	36.68	17	45.89	320	1.33	32	47.94	336
19.0	42.207 —	44	53.57	198	47.631 —	44	64.86	125	36.51	8	42.69	342	1.01	21	44.58	356
29.0	42.251	118	51.59	185	47.675	101	63.61	109	36.43	1	39.27	357	0.80	9	41.02	366
May 9.0	42.369	192	49.74	165	47.776	159	62.52	89	36.42 —	7	35.70	361	0.71 —	5	37.36	368
19.0	42.561	259	48.09	140	47.935	212	61.63	63	36.49	14	32.09	359	0.76	16	33.68	362
28.9	42.820	321	46.69	110	48.147	261	61.00	38	36.63	22	28.50	348	0.92	27	30.06	346
June 7.9	43.141	374	45.59	76	48.408	304	60.62	8	36.85	29	25.02	329	1.19	39	26.60	325
17.9	43.515	417	44.83	40	48.712	336	60.54 —	21	37.14	34	21.73	300	1.58	49	23.35	293
27.9	43.932	450	44.43	4	49.048	363	60.75	48	37.48	41	18.73	264	2.07	57	20.42	253
July 7.8	44.382	471	44.39 —	33	49.411	378	61.23	76	37.89	44	16.09	222	2.64	65	17.89	208
17.8	44.853	482	44.72	68	49.789	387	61.99	100	38.33	47	13.87	172	3.29	69	15.81	155
27.8	45.335	484	45.40	101	50.176	388	62.99	122	38.80	48	12.15	117	3.98	72	14.26	98
Aug. 6.7	45.819	476	46.41	132	50.564	380	64.21	139	39.28	49	10.98	58	4.70	74	13.28	39
16.7	46.295	460	47.73	160	50.944	366	65.60	154	39.77	47	10.40 —	4	5.44	72	12.89 —	23
26.7	46.755	436	49.33	183	51.310	346	67.14	166	40.24	45	10.44	63	6.16	69	13.12	85
Sept. 5.7	47.191	406	51.16	203	51.656	324	68.80	172	40.69	40	11.07	124	6.85	63	13.97	145
15.6	47.597	372	53.19	219	51.980	295	70.52	176	41.09	37	12.31	178	7.48	55	15.42	199
25.6	47.969	333	55.38	231	52.275	265	72.28	177	41.46	31	14.09	228	8.03	45	17.41	247
Oct. 5.6	48.302	291	57.69	238	52.540	234	74.05	175	41.77	24	16.37	269	8.48	35	19.88	285
15.6	48.593	244	60.07	242	52.774	198	75.80	170	42.01	18	19.06	300	8.83	23	22.73	315
25.5	48.837	196	62.49	240	52.972	162	77.50	163	42.19	10	22.06	319	9.06	11	25.88	331
Nov. 4.5	49.033	143	64.89	234	53.134	123	79.13	154	42.29	2	25.25	326	9.17 —	4	29.19	335
14.5	49.176	88	67.23	223	53.257	83	80.67	141	42.31 —	5	28.51	322	9.13	16	32.54	327
24.4	49.264	32	69.46	206	53.340	41	82.08	126	42.26	13	31.73	304	8.97	28	35.81	305
Dec. 4.4	49.296 —	26	71.52	184	53.381	0	83.34	107	42.13	19	34.77	277	8.69	40	38.86	274
14.4	49.270	82	73.36	156	53.381	43	84.41	87	41.94	25	37.54	238	8.29	50	41.60	232
24.4	49.188	136	74.92	122	53.338	85	85.28	62	41.69	31	39.92	193	7.79	58	43.92	182
34.3	49.052		76.14		53.253		85.90		41.38		41.85		7.21		45.74	
Mean Place	42.207		42.50		47.281		55.88		37.770		46.89		4.223		49.75	
Sec δ, Tan δ	1.669		+1.336		1.278		+0.796		2.004		−1.736		3.276		−3.120	
$D_\psi \alpha$, $D_\omega \alpha$	+0.09		−0.06		+0.08		−0.04		+0.03		+0.08		0.00		+0.15	
$D_\psi \delta$, $D_\omega \delta$	+0.3		+0.7		+0.3		+0.7		+0.3		+0.7		+0.3		+0.7	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	**β Persei.** (*Algol.*) Var. 2.1-3.2				**δ Arietis.** Mag. 4.5				**12 Eridani.** Mag. 4.0				**48 H. Cephei.** Mag. 5.5			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	3 2		+40 37		3 6		+19 24		3 8		−29 18		3 9		+77 25	
	s		″		s		″		s		″		s		″	
Jan. 0.4	43.733	109	75.59	58	51.077	75	47.10	21	31.891	122	65.14	152	41.68	59	62.71	195
10.3	43.624	144	76.17	28	51.002	103	46.89	30	31.769	148	66.66	116	41.09	72	64.66	143
20.3	43.480	174	76.45	— 1	50.899	128	46.59	38	31.621	172	67.82	77	40.37	81	66.09	87
30.3	43.306	193	76.44	33	50.771	145	46.21	47	31.449	185	68.59	36	39.56	86	66.96	28
Feb. 9.2	43.113	202	76.11	62	50.626	153	45.74	53	31.264	193	68.95	— 5	38.70	88	67.24	— 31
19.2	42.911	200	75.49	89	50.473	155	45.21	59	31.071	191	68.90	45	37.82	86	66.93	89
29.2	42.711	185	74.60	113	50.318	144	44.62	60	30.880	181	68.45	86	36.96	79	66.04	144
Mar. 10.2	42.526	158	73.47	130	50.174	123	44.02	60	30.699	160	67.59	124	36.17	69	64.60	189
20.1	42.368	119	72.17	142	50.051	96	43.42	54	30.539	132	66.35	160	35.48	57	62.71	229
30.1	42.249	73	70.75	146	49.955	58	42.88	46	30.407	97	64.75	192	34.91	40	60.42	257
Apr. 9.1	42.176	18	69.29	145	49.897	15	42.42	34	30.310	55	62.83	222	34.51	21	57.85	276
19.1	42.158	— 39	67.84	136	49.882	— 31	42.08	17	30.255	8	60.61	246	34.30	4	55.09	283
29.0	42.197	101	66.48	120	49.913	81	41.91	— 1	30.247	— 41	58.15	267	34.26	— 16	52.26	281
May 9.0	42.298	158	65.28	102	49.994	128	41.92	22	30.288	91	55.48	281	34.42	34	49.45	269
19.0	42.456	214	64.26	77	50.122	175	42.14	41	30.379	139	52.67	289	34.76	53	46.76	246
28.9	42.670	264	63.49	50	50.297	216	42.55	64	30.518	184	49.78	291	35.29	70	44.30	218
June 7.9	42.934	308	62.99	20	50.513	254	43.19	82	30.702	225	46.87	286	35.99	83	42.12	184
17.9	43.242	343	62.79	— 10	50.767	282	44.01	100	30.927	260	44.01	274	36.82	95	40.28	143
27.9	43.585	369	62.89	38	51.049	306	45.01	116	31.187	287	41.27	253	37.77	105	38.85	98
July 7.8	43.954	387	63.27	67	51.355	321	46.17	127	31.474	308	38.74	227	38.82	114	37.87	51
17.8	44.341	396	63.94	92	51.676	328	47.44	135	31.782	321	36.47	194	39.96	117	37.36	4
27.8	44.737	397	64.86	116	52.004	330	48.79	138	32.103	326	34.53	154	41.13	119	37.32	— 41
Aug. 6.8	45.134	391	66.02	136	52.334	324	50.17	138	32.429	324	32.99	110	42.32	119	37.73	89
16.7	45.525	377	67.38	152	52.658	313	51.55	135	32.753	314	31.89	64	43.51	117	38.62	132
26.7	45.902	357	68.90	165	52.971	296	52.90	127	33.067	298	31.25	13	44.68	111	39.94	175
Sept. 5.7	46.259	334	70.55	175	53.267	278	54.17	116	33.365	277	31.12	— 35	45.79	106	41.69	211
15.6	46.593	306	72.30	180	53.545	254	55.33	104	33.642	250	31.47	83	46.85	97	43.80	246
25.6	46.899	276	74.10	183	53.799	230	56.37	91	33.892	220	32.30	128	47.82	88	46.26	274
Oct. 5.6	47.175	242	75.93	184	54.029	202	57.28	76	34.112	189	33.58	167	48.70	75	49.00	299
15.6	47.417	207	77.77	180	54.231	173	58.04	62	34.301	152	35.25	197	49.45	62	51.99	316
25.5	47.624	170	79.57	174	54.404	145	58.66	49	34.453	115	37.22	222	50.07	48	55.15	327
Nov. 4.5	47.794	129	81.31	165	54.549	113	59.15	36	34.568	78	39.44	237	50.55	32	58.42	331
14.5	47.923	88	82.96	153	54.662	80	59.51	23	34.646	40	41.81	241	50.87	15	61.73	327
24.5	48.011	45	84.49	139	54.742	48	59.74	13	34.686	3	44.22	238	51.02	— 1	65.00	313
Dec. 4.4	48.056	0	85.88	119	54.790	12	59.87	3	34.689	— 35	46.60	224	51.01	20	68.13	292
14.4	48.056	44	87.07	99	54.802	— 24	59.90	— 7	34.654	72	48.84	202	50.81	35	71.05	260
24.4	48.012	87	88.06	72	54.778	57	59.83	16	34.582	106	50.86	174	50.46	51	73.65	221
34.3	47.925		88.78		54.721		59.67		34.476		52.60		49.95		75.86	
Mean Place	41.830		58.42		49.362		35.44		30.108		63.72		36.856		39.91	
Sec δ, Tan δ	1.318		+0.858		1.060		+0.352		1.147		−0.561		4.596		+4.486	
$D_\psi a$, $D_\omega a$	+0.08		−0.04		+0.07		−0.02		+0.05		+0.03		+0.15		−0.20	
$D_\psi \delta$, $D_\omega \delta$	+0.3		+0.7		+0.3		+0.7		+0.3		+0.7		+0.3		+0.7	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ζ Arietis. Mag. 5.0				38 G. Horologii Mag. 5.7				ζ Eridani. Mag. 4.9				τ Arietis. Mag. 5.2			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	3 10		+20 44		3 10		−57 37		3 11		− 9 7		3 16		+20 50	
	s		″		s		″		s		″		s		″	
Jan. 0.4	5.928	74	13.76	15	27.665	295	75.65	172	46.805	81	47.87	113	24.246	72	53.74	14
10.3	5.854	103	13.61	27	27.370	331	77.37	119	46.724	107	49.00	95	24.174	99	53.60	24
20.3	5.751	129	13.34	34	27.039	361	78.56	63	46.617	130	49.95	74	24.075	127	53.36	33
30.3	5.622	146	13.00	45	26.678	376	79.19	6	46.487	147	50.69	51	23.948	146	53.03	43
Feb. 9.2	5.476	157	12.55	53	26.302	381	79.25	— 50	46.340	155	51.20	28	23.802	156	52.60	50
19.2	5.319	157	12.02	60	25.921	373	78.75	104	46.185	156	51.48	3	23.646	158	52.10	57
29.2	5.162	146	11.42	61	25.548	352	77.71	155	46.029	146	51.51	— 22	23.488	150	51.53	60
Mar. 10.2	5.016	128	10.81	64	25.196	319	76.16	202	45.883	130	51.29	47	23.338	132	50.93	62
20.1	4.888	98	10.17	59	24.877	276	74.14	244	45.753	104	50.82	73	23.206	104	50.31	58
30.1	4.790	61	9.58	54	24.601	222	71.70	280	45.649	72	50.09	98	23.102	66	49.73	52
Apr. 9.1	4.729	18	9.04	41	24.379	160	68.90	310	45.577	31	49.11	123	23.036	24	49.21	41
19.1	4.711	— 26	8.63	25	24.219	91	65.80	333	45.546	— 11	47.88	144	23.012	— 21	48.80	26
29.0	4.737	78	8.38	9	24.128	20	62.47	350	45.557	55	46.44	165	23.033	72	48.54	10
May 9.0	4.815	127	8.29	— 12	24.108	— 55	58.97	356	45.612	102	44.79	184	23.105	120	48.44	— 9
19.0	4.942	172	8.41	33	24.163	128	55.41	357	45.714	145	42.95	198	23.225	167	48.53	30
28.9	5.114	215	8.74	52	24.291	200	51.84	348	45.859	186	40.97	209	23.392	210	48.83	50
June 7.9	5.329	251	9.26	76	24.491	263	48.36	331	46.045	222	38.88	214	23.602	248	49.33	70
17.9	5.580	283	10.02	92	24.754	322	45.05	305	46.267	252	36.74	214	23.850	278	50.03	88
27.9	5.863	306	10.94	108	25.076	373	42.00	272	46.519	276	34.60	208	24.128	304	50.91	104
July 7.8	6.169	323	12.02	119	25.449	411	39.28	230	46.795	293	32.52	196	24.432	319	51.95	117
17.8	6.492	330	13.21	131	25.860	439	36.98	183	47.088	303	30.56	179	24.751	329	53.12	124
27.8	6.822	332	14.52	134	26.299	455	35.15	130	47.391	308	28.77	156	25.080	331	54.36	131
Aug. 6.8	7.154	326	15.86	136	26.754	459	33.85	71	47.699	301	27.21	129	25.411	328	55.67	133
16.7	7.480	316	17.22	134	27.213	449	33.14	12	48.000	292	25.92	97	25.739	319	57.00	129
26.7	7.796	299	18.56	129	27.662	429	33.02	— 51	48.292	278	24.95	63	26.058	302	58.29	124
Sept. 5.7	8.095	283	19.85	117	28.091	398	33.53	109	48.570	261	24.32	28	26.360	286	59.53	114
15.6	8.378	257	21.02	107	28.489	355	34.62	166	48.831	237	24.04	— 10	26.646	263	60.67	106
25.6	8.635	235	22.09	96	28.844	305	36.28	216	49.068	213	24.14	43	26.909	239	61.73	93
Oct. 5.6	8.870	206	23.05	81	29.149	246	38.44	260	49.281	185	24.57	73	27.148	213	62.66	77
15.6	9.076	180	23.86	68	29.395	181	41.04	291	49.466	157	25.30	101	27.361	186	63.43	67
25.5	9.256	149	24.54	54	29.576	115	43.95	315	49.623	128	26.31	122	27.547	155	64.10	53
Nov. 4.5	9.405	117	25.08	44	29.691	44	47.10	325	49.751	95	27.53	139	27.702	124	64.63	42
14.5	9.522	85	25.52	32	29.735	— 24	50.35	322	49.846	64	28.92	146	27.826	91	65.05	31
24.5	9.607	51	25.84	19	29.711	93	53.57	308	49.910	32	30.38	150	27.917	55	65.36	19
Dec. 4.4	9.658	13	26.03	11	29.618	157	56.65	284	49.942	— 1	31.88	148	27.972	21	65.55	10
14.4	9.671	— 20	26.14	— 1	29.461	215	59.49	247	49.941	33	33.36	138	27.993	— 14	65.65	1
24.4	9.651	56	26.13	11	29.246	269	61.96	205	49.908	65	34.74	126	27.979	51	65.66	— 2
34.3	9.595		26.02		28.977		64.01		49.843		36.00		27.928		65.64	
Mean Place	4.187		1.81		25.278		69.11		45.116		51.61		22.469		41.90	
Sec δ, Tan δ	1.069		+0.379		1.868		−1.578		1.013		−0.161		1.070		+0.381	
Dψ α, Dω α	+0.07		−0.02		+0.03		+0.07		+0.06		+0.01		+0.07		−0.02	
Dψ δ, Dω δ	+0.3		+0.7		+0.3		+0.7		+0.3		+0.7		+0.3		+0.8	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ε Eridani. Mag. 4.3				ι Hydri. Mag. 5.5				α Persei. Mag. 1.9				ο Tauri. Mag. 3.8			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	3 16		−43 22		3 17		−77 41		3 18		+49 33		3 20		+ 8 44	
	s		″		s		″		s		″		s		″	
Jan. 0.4	36.362		89.54		66.42		52.55		21.305		65.90		19.176		11.09	
10.3	36.194	168	91.29	175	65.50	92	54.16	161	21.180	125	66.92	102	19.111	65	10.51	58
20.3	35.995	199	92.58	129	64.48	102	55.21	105	21.008	172	67.60	68	19.017	94	9.94	57
30.3	35.771	224	93.39	81	63.41	107	55.66	45 —	20.799	209	67.92	32 —	18.897	120	9.39	55
Feb. 9.3	35.530	241	93.70	31 —	62.31	110	55.52	14	20.564	235	67.84	8	18.759	138	8.89	50
19.2	35.281	249	93.51	19	61.21	110	54.80	72	20.315	249	67.40	44	18.610	149	8.44	45
29.2	35.034	247	92.81	70	60.13	108	53.52	128	20.066	249	66.58	82	18.459	151	8.06	38
Mar. 10.2	34.800	234	91.63	118	59.12	101	51.73	179	19.831	235	65.44	114	18.314	145	7.76	30
20.1	34.588	212	90.02	161	58.18	94	49.49	224	19.626	205	64.03	141	18.186	128	7.57	19
30.1	34.408	180	88.00	202	57.35	83	46.83	266	19.463	163	62.40	163	18.083	103	7.50	7 —
Apr. 9.1	34.270	138	85.62	238	56.64	71	43.84	299	19.352	111	60.64	176	18.014	69	7.57	7
19.1	34.178	92	82.92	270	56.08	56	40.58	326	19.304	48 —	58.83	181	17.984	30 —	7.82	25
29.0	34.139	39 —	79.96	296	55.68	40	37.13	345	19.321	17	57.03	180	17.998	14	8.24	42
May 9.0	34.155	16	76.81	315	55.44	24	33.53	360	19.408	87	55.34	169	18.058	60	8.86	62
19.0	34.228	73	73.54	327	55.37	7 —	29.89	364	19.562	154	53.79	155	18.165	107	9.66	80
29.0	34.359	131	70.21	333	55.47	10	26.30	359	19.782	220	52.46	133	18.316	151	10.65	99
June 7.9	34.543	184	66.91	330	55.75	28	22.83	347	20.062	280	51.40	106	18.508	192	11.81	116
17.9	34.776	233	63.72	319	56.19	44	19.59	324	20.394	332	50.64	76	18.736	228	13.10	129
27.9	35.053	277	60.72	300	56.78	59	16.62	297	20.768	374	50.19	45	18.996	260	14.50	140
July 7.8	35.366	313	57.96	276	57.50	72	14.02	260	21.178	410	50.08	11 —	19.278	282	15.98	148
17.8	35.708	342	55.57	239	58.33	83	11.87	215	21.611	433	50.29	21	19.579	301	17.48	150
27.8	36.068	360	53.58	199	59.25	92	10.22	165	22.060	449	50.81	52	19.888	309	18.97	149
Aug. 6.8	36.439	371	52.07	151	60.23	98	9.14	108	22.514	454	51.64	83	20.201	313	20.40	143
16.7	36.811	372	51.07	100	61.24	101	8.66	48 —	22.964	450	52.75	111	20.511	310	21.72	132
26.7	37.176	365	50.64	43 —	62.25	101	8.75	9	23.402	438	54.10	135	20.811	300	22.89	117
Sept. 5.7	37.525	349	50.76	12	63.22	97	9.49	74	23.823	421	55.67	157	21.099	288	23.89	100
15.7	37.850	325	51.45	69	64.12	90	10.85	136	24.220	397	57.42	175	21.370	271	24.68	79
25.6	38.146	296	52.69	124	64.93	81	12.73	188	24.589	369	59.31	189	21.619	249	25.27	59
Oct. 5.6	38.407	261	54.42	173	65.61	68	15.13	240	24.925	336	61.32	201	21.847	228	25.64	37
15.6	38.626	219	56.58	216	66.14	53	17.93	280	25.223	298	63.42	210	22.049	202	25.79	15 —
25.5	38.802	176	59.09	251	66.50	36	21.04	311	25.482	259	65.55	213	22.224	175	25.75	4
Nov. 4.5	38.932	130	61.83	274	66.68	18 —	24.34	330	25.697	215	67.68	213	22.372	148	25.54	21
14.5	39.013	81	64.73	290	66.66	2	27.71	337	25.866	169	69.76	208	22.489	117	25.20	34
24.5	39.046	33 —	67.66	293	66.45	21	31.03	332	25.984	118	71.78	202	22.576	87	24.74	46
Dec. 4.4	39.031	15	70.52	286	66.06	39	34.16	313	26.049	65	73.67	189	22.630	54	24.20	54
14.4	38.969	62	73.18	266	65.49	57	37.00	284	26.060	11 —	75.36	169	22.650	20 —	23.62	58
24.4	38.863	106	75.57	239	64.77	72	39.45	245	26.015	45	76.85	149	22.636	14	23.01	61
34.4	38.716	147	77.59	202	63.92	85	41.40	195	25.917	98	78.04	119	22.589	47	22.40	61
Mean Place	34.358		85.47		61.586		44.73		19.065		47.48		17.438		2.54	
Sec δ, Tan δ	1.376		−0.945		4.691		−4.584		1.542		+1.174		1.012		+0.154	
$D_\psi \alpha$, $D_\omega \alpha$	+0.04		+0.04		−0.03		+0.20		+0.08		−0.05		+0.06		−0.01	
$D_\psi \delta$, $D_\omega \delta$	+0.3		+0.8		+0.3		+0.8		+0.3		+0.8		+0.3		+0.8	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	2 H. Camelop. Mag. 4.4				ξ Tauri. Mag. 3.8				f Tauri. Mag. 4.3				ε Eridani. Mag. 3.8			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	3 22		+59 38		3 22		+ 9 26		3 26		+12 38		3 28		− 9 44	
	s		″		s		″		s		″		s		″	
Jan. 0.4	18.102	182	75.37	145	38.629	64	34.35	56	15.777	61	68.14	44	60.064	77	26.96	121
10.3	17.920	241	76.82	104	38.565	92	33.79	55	15.716	91	67.70	46	59.987	106	28.17	102
20.3	17.679	288	77.86	60	38.473	119	33.24	53	15.625	119	67.24	46	59.881	130	29.19	80
30.3	17.391	322	78.46	14	38.354	137	32.71	49	15.506	139	66.78	47	59.751	149	29.99	56
Feb. 9.3	17.069	338	78.60	34	38.217	149	32.22	45	15.367	151	66.31	45	59.602	159	30.55	31
19.2	16.731	338	78.26	79	38.068	152	31.77	39	15.216	155	65.86	43	59.443	163	30.86	6
29.2	16.393	319	77.47	121	37.916	146	31.38	32	15.061	148	65.43	39	59.280	157	30.92	20
Mar. 10.2	16.074	280	76.26	157	37.770	128	31.06	21	14.913	133	65.04	32	59.123	142	30.72	46
20.1	15.794	228	74.69	185	37.642	104	30.85	10	14.780	107	64.72	22	58.981	116	30.26	72
30.1	15.566	161	72.84	208	37.538	71	30.75	5	14.673	73	64.50	11	58.865	85	29.54	97
Apr. 9.1	15.405	84	70.76	219	37.467	32	30.80	21	14.600	34	64.39	1	58.780	48	28.57	122
19.1	15.321	1	68.57	223	37.435	13	31.01	37	14.566	10	64.40	20	58.732	5	27.35	146
29.0	15.322	87	66.34	218	37.448	58	31.38	57	14.576	57	64.60	37	58.727	41	25.89	166
May 9.0	15.409	173	64.16	203	37.506	105	31.95	76	14.633	105	64.97	56	58.768	86	24.23	183
19.0	15.582	255	62.13	184	37.611	149	32.71	94	14.738	149	65.53	75	58.854	131	22.40	196
29.0	15.837	331	60.29	157	37.760	191	33.65	111	14.887	191	66.28	91	58.985	172	20.42	208
June 7.9	16.168	396	58.72	126	37.951	227	34.76	125	15.078	228	67.19	107	59.157	210	18.34	214
17.9	16.564	454	57.46	92	38.178	259	36.01	136	15.306	261	68.26	122	59.367	241	16.20	213
27.9	17.018	498	56.54	54	38.437	284	37.37	144	15.567	284	69.48	130	59.608	267	14.07	207
July 7.8	17.516	531	56.00	17	38.721	300	38.81	147	15.851	303	70.78	137	59.875	285	12.00	196
17.8	18.047	551	55.83	22	39.021	310	40.28	147	16.154	313	72.15	138	60.160	297	10.04	179
27.8	18.598	562	56.05	58	39.331	314	41.75	141	16.467	316	73.53	135	60.457	303	8.25	154
Aug. 6.8	19.160	560	56.63	93	39.645	311	43.16	131	16.783	315	74.88	129	60.760	301	6.71	126
16.7	19.720	548	57.56	127	39.956	302	44.47	117	17.098	306	76.17	118	61.061	294	5.45	96
26.7	20.268	528	58.83	158	40.258	289	45.64	100	17.404	295	77.35	106	61.355	281	4.49	60
Sept. 5.7	20.796	500	60.41	182	40.547	274	46.64	82	17.699	278	78.41	88	61.636	266	3.89	23
15.7	21.296	466	62.23	207	40.821	251	47.46	60	17.977	257	79.29	70	61.902	245	3.66	13
25.6	21.762	424	64.30	226	41.072	230	48.06	39	18.234	236	79.99	52	62.147	220	3.79	47
Oct. 5.6	22.186	378	66.56	241	41.302	205	48.45	18	18.470	211	80.51	34	62.367	196	4.26	81
15.6	22.564	325	68.97	251	41.507	179	48.63	0	18.681	186	80.85	15	62.563	169	5.07	109
25.5	22.889	269	71.48	258	41.686	150	48.63	17	18.867	157	81.00	2	62.732	138	6.16	130
Nov. 4.5	23.158	207	74.06	257	41.836	119	48.46	31	19.024	126	81.02	12	62.870	107	7.46	147
14.5	23.365	140	76.63	252	41.955	90	48.15	42	19.150	97	80.90	24	62.977	75	8.93	157
24.5	23.505	71	79.15	241	42.045	57	47.73	50	19.247	62	80.66	31	63.052	43	10.50	160
Dec. 4.4	23.573	3	81.56	221	42.102	22	47.23	55	19.309	27	80.35	37	63.095	7	12.10	157
14.4	23.573	75	83.77	197	42.124	12	46.68	58	19.336	8	79.98	42	63.102	27	13.67	149
24.4	23.498	145	85.74	165	42.112	45	46.10	59	19.328	42	79.56	45	63.075	59	15.16	134
34.4	23.353		87.39		42.067		45.51		19.286		79.11		63.016		16.50	
Mean Place	15.401		55.40		36.879		25.64		13.995		58.64		58.316		30.51	
Sec δ, Tan δ	1.979		+1.708		1.014		+0.166		1.025		+0.224		1.014		−0.172	
Dψ α, Dω α	+0.10		−0.07		+0.06		−0.01		+0.06		−0.01		+0.06		+0.01	
Dψ δ, Dω δ	+0.3		+0.8		+0.3		+0.8		+0.2		+0.8		+0.2		+0.8	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	τ^6 Eridani. Mag. 4.3				δ Persei. Mag. 3.1				δ Eridani. Mag. 3.7				ν Persei. Mag. 3.9			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	3 30		−21 54		3 36		+47 31		3 39		−10 2		3 39		+42 18	
	s		″		s		″		s		″		s		″	
Jan. 0.4	6.363		49.83		58.591		29.11		15.222		46.15		31.137		67.39	
10.3	6.272	91	51.37	154	58.491	100	30.17	106	15.154	68	47.42	127	31.055	82	68.25	86
20.3	6.148	124	52.63	126	58.344	147	30.92	75	15.057	97	48.49	107	30.929	126	68.84	59
30.3	6.001	147	53.58	95	58.157	187	31.35	43	14.931	126	49.34	85	30.765	164	69.14	30
Feb. 9.3	5.834	167	54.17	59	57.938	219	31.42	7 —	14.786	145	49.95	61	30.572	193	69.14	0
19.2	5.656	178	54.41	24 —	57.702	236	31.14	28	14.627	159	50.31	36	30.361	211	68.84	30
29.2	5.475	181	54.28	13	57.460	242	30.50	64	14.462	165	50.41	10 —	30.143	218	68.24	60
Mar. 10.2	5.300	175	53.81	47	57.226	234	29.56	94	14.302	160	50.24	17	29.933	210	67.38	86
20.2	5.142	158	52.98	83	57.017	209	28.34	122	14.154	148	49.82	42	29.743	190	66.29	109
30.1	5.006	136	51.81	117	56.844	173	26.90	144	14.030	124	49.13	69	29.586	157	65.02	127
Apr. 9.1	4.904	102	50.35	146	56.718	126	25.32	158	13.935	95	48.20	93	29.472	114	63.64	138
19.1	4.839	65	48.58	177	56.650	68	23.64	168	13.877	58	47.00	120	29.409	63	62.21	143
29.0	4.819	20 —	46.55	203	56.644	6 —	21.97	167	13.860	17 —	45.59	141	29.405	4 —	60.79	142
May 9.0	4.845	26	44.33	222	56.704	60	20.36	161	13.888	28	43.93	166	29.460	55	59.44	135
19.0	4.918	73	41.92	241	56.830	126	18.88	148	13.962	74	42.10	183	29.577	117	58.24	120
29.0	5.037	119	39.36	256	57.020	190	17.57	131	14.081	119	40.13	197	29.752	175	57.20	104
June 7.9	5.201	164	36.75	261	57.269	249	16.50	107	14.242	161	38.03	210	29.982	230	56.40	80
17.9	5.404	203	34.15	260	57.570	301	15.69	81	14.442	200	35.88	215	30.261	279	55.83	57
27.9	5.641	237	31.60	255	57.918	348	15.16	53	14.673	231	33.73	215	30.582	321	55.53	30
July 7.9	5.909	268	29.19	241	58.300	382	14.93	23 —	14.934	261	31.63	210	30.936	354	55.49	4 —
17.8	6.198	289	26.98	221	58.711	411	15.00	7	15.214	280	29.63	200	31.315	379	55.73	24
27.8	6.500	302	25.02	196	59.139	428	15.37	37	15.508	294	27.81	182	31.711	396	56.22	49
Aug. 6.8	6.811	311	23.40	162	59.575	436	16.01	64	15.809	301	26.21	160	32.115	404	56.95	73
16.7	7.122	311	22.14	126	60.012	437	16.91	90	16.112	303	24.89	132	32.519	404	57.88	93
26.7	7.426	304	21.31	83	60.443	431	18.04	113	16.409	297	23.88	101	32.916	397	59.01	113
Sept. 5.7	7.720	294	20.93	38 —	60.860	417	19.37	133	16.696	287	23.23	65	33.302	386	60.28	127
15.7	7.997	277	21.00	7	61.257	397	20.88	151	16.969	273	22.95	28 —	33.671	369	61.68	140
25.6	8.252	255	21.51	51	61.630	373	22.53	165	17.223	254	23.03	8	34.016	345	63.18	150
Oct. 5.6	8.483	231	22.45	94	61.975	345	24.29	176	17.456	233	23.48	45	34.337	321	64.76	158
15.6	8.685	202	23.78	133	62.287	312	26.14	185	17.663	207	24.26	78	34.628	291	66.38	162
25.6	8.857	172	25.44	166	62.563	276	28.04	190	17.845	182	25.33	107	34.886	258	68.04	166
Nov. 4.5	8.997	140	27.36	192	62.799	236	29.96	192	17.998	153	26.63	130	35.108	222	69.67	163
14.5	9.104	107	29.45	209	62.991	192	31.87	191	18.120	122	28.10	147	35.291	183	71.28	161
24.5	9.174	70	31.63	218	63.135	144	33.73	186	18.211	91	29.69	159	35.431	140	72.84	156
Dec. 4.4	9.208	34 —	33.82	219	63.228	93	35.49	176	18.267	56	31.32	163	35.524	93	74.31	147
14.4	9.206	2	35.93	211	63.267	39 —	37.11	162	18.288	21 —	32.93	161	35.569	45 —	75.65	134
24.4	9.168	38	37.89	196	63.251	16	38.56	145	18.274	14	34.45	152	35.564	5	76.82	117
34.4	9.092	76	39.65	176	63.182	69	39.76	120	18.226	48	35.85	140	35.509	55	77.80	98
Mean Place	4.554		50.59		56.244		11.99		13.421		49.84		28.910		51.41	
Sec δ, Tan δ	1.078		−0.402		1.481		+1.092		1.015		−0.177		1.353		+0.911	
$D_\psi \alpha$, $D_\omega \alpha$	+0.05		+0.02		+0.08		−0.04		+0.06		+0.01		+0.08		−0.04	
$D_\psi \delta$, $D_\omega \delta$	+0.2		+0.8		+0.2		+0.8		+0.2		+0.8		+0.2		+0.8	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	5 H. Camelop. Mag. 4.7				*η* Tauri. (*Alcyone.*) Mag. 3.0				*τ*⁶ Eridani. Mag. 4.3				*g* Erid Mag.	
	Right Ascension.	Diff.	Declination.	Diff.	Right Ascension.	Diff.	Declination.	Diff.	Right Ascension.	Diff.	Declination.	Diff.	Right Ascension.	Diff.
	h m 3 41		° ′ +71 4		h m 3 42		° ′ +23 50		h m 3 43		° ′ −23 29		h m 3 46	
	s		″		s		″		s		″		s	
Jan. 0.4	32.31		49.46		31.229		58.31		15.883		46.78		20.683	
10.4	32.01	30	51.48	202	31.177	52	58.35	4	15.794	89	48.48	170	20.559	124
20.3	31.62	39	53.07	159	31.087	90	58.29	6	15.673	121	49.89	141	20.399	160
30.3	31.15	47	54.17	110	30.965	122	58.12	17	15.525	148	50.96	107	20.209	190
Feb. 9.3	30.62	53	54.75	58	30.820	145	57.83	29	15.355	170	51.66	70	19.995	214
19.2	30.06	56	54.76	1	30.657	163	57.43	40	15.171	184	52.00	34	19.768	227
29.2	29.49	57	54.24	52	30.488	169	56.94	49	14.982	189	51.97	3	19.536	232
Mar 10.2	28.94	55	53.20	104	30.324	164	56.38	56	14.797	185	51.54	43	19.309	227
20.2	28.44	50	51.69	151	30.173	151	55.76	62	14.626	171	50.77	77	19.098	211
30.1	28.02	42	49.79	190	30.049	124	55.12	64	14.478	148	49.64	113	18.911	187
Apr. 9.1	27.69	33	47.56	223	29.959	90	54.51	61	14.360	118	48.20	144	18.758	153
19.1	27.48	21	45.11	245	29.909	50	53.96	55	14.281	79	46.45	175	18.646	112
29.1	27.40	8	42.51	260	29.906	3	53.51	45	14.245	36	44.42	203	18.581	65
May 9.0	27.43	3	39.89	262	29.952	46	53.19	32	14.254	9	42.18	224	18.566	15
19.0	27.61	18	37.34	255	30.050	98	53.04	15	14.312	58	39.74	244	18.604	38
29.0	27.92	31	34.92	242	30.196	146	53.06	2	14.417	105	37.17	257	18.695	91
June 7.9	28.33	41	32.74	218	30.386	190	53.28	22	14.566	149	34.52	265	18.836	141
17.9	28.86	53	30.84	190	30.618	232	53.68	40	14.757	191	31.87	265	19.024	188
27.9	29.47	61	29.28	156	30.884	266	54.26	58	14.984	227	29.28	259	19.254	230
July 7.9	30.17	70	28.10	118	31.178	294	55.02	76	15.242	258	26.82	246	19.521	267
17.8	30.92	75	27.32	78	31.493	315	55.90	88	15.523	281	24.55	227	19.816	295
27.8	31.73	81	26.96	36	31.821	328	56.90	100	15.821	298	22.56	199	20.133	317
Aug. 6.8	32.56	83	27.03	7	32.156	335	57.97	107	16.131	310	20.90	166	20.463	330
16.8	33.40	84	27.51	48	32.491	335	59.08	111	16.442	311	19.62	128	20.800	337
26.7	34.23	83	28.41	90	32.821	330	60.21	113	16.749	307	18.76	86	21.135	335
Sept. 5.7	35.04	81	29.70	129	33.141	320	61.30	109	17.049	300	18.36	40	21.462	327
15.7	35.81	77	31.35	165	33.445	304	62.35	105	17.333	284	18.43	7	21.772	310
25.6	36.54	73	33.33	198	33.732	287	63.33	98	17.597	264	18.97	54	22.061	289
Oct. 5.6	37.22	68	35.59	226	33.997	265	64.22	89	17.838	241	19.95	98	22.323	262
15.6	37.83	61	38.12	253	34.239	242	65.02	80	18.052	214	21.33	138	22.555	232
25.6	38.37	54	40.84	272	34.454	215	65.71	69	18.238	186	23.07	174	22.750	195
Nov. 4.5	38.81	44	43.71	287	34.642	188	66.31	60	18.390	152	25.09	202	22.907	157
14.5	39.14	33	46.68	297	34.797	155	66.82	51	18.509	119	27.29	220	23.023	116
24.5	39.38	24	49.64	296	34.919	122	67.25	43	18.591	82	29.60	231	23.096	73
Dec. 4.5	39.50	12	52.54	290	35.005	86	67.59	34	18.637	46	31.93	233	23.124	28
14.4	39.51	1	55.32	278	35.053	48	67.84	25	18.643	6	34.18	225	23.108	16
24.4	39.39	12	57.88	256	35.061	8	68.02	18	18.612	31	36.29	211	23.048	60
34.4	39.15	24	60.09	221	35.029	32	68.10	8	18.544	68	38.18	189	22.946	102
Mean Place	28.175		29.21		29.281		46.45		14.014		47.47		18.679	
Sec *δ*, Tan *δ*	3.084		+2.917		1.093		+0.442		1.090		−0.434		1.243	
D$_\psi$ *a*, D$_\omega$ *a*	+0.12		−0.11		+0.07		−0.02		+0.05		+0.02		+0.04	
D$_\psi$ *δ*, *D*$_\omega$ *δ*	*+0.2*		+0.8		+0.2		+0.8		+0.2		+0.8		+0.2	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Hydri. Mag. 3.2				ζ Persei. Mag. 2.9				9 H. Camelop. Mag. 5.2				ε Persei. Mag. 3.0			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	3 48		−74 29		3 48		+31 38		3 49		+60 51		3 52		+39 46	
	s		″		s		″		s		″		s		″	
Jan. 0.4	35.74		53.92		52.953		19.75		60.95		68.86		15.024		20.50	
10.4	35.09	65	55.99	207	52.897	56	20.16	41	60.80	15	70.56	170	14.960	64	21.29	79
20.3	34.33	76	57.54	155	52.803	94	20.40	24	60.58	22	71.89	133	14.851	109	21.87	58
30.3	33.51	82	58.53	99	52.673	130	20.47	7	60.31	27	72.81	92	14.703	148	22.19	32
Feb. 9.3	32.65	86	58.93	40	52.514	159	20.35	— 12	59.98	33	73.29	48	14.524	179	22.25	6
19.2	31.77	88	58.75	— 18	52.338	176	20.03	32	59.63	35	73.28	— 1	14.324	200	22.02	— 23
29.2	30.89	88	58.01	74	52.153	185	19.54	49	59.27	36	72.82	46	14.114	210	21.54	48
Mar. 10.2	30.03	86	56.73	128	51.972	181	18.88	66	58.92	35	71.90	92	13.908	206	20.80	74
20.2	29.23	80	54.95	178	51.806	166	18.09	79	58.59	33	70.59	131	13.719	189	19.86	94
30.1	28.51	72	52.71	224	51.667	139	17.22	87	58.32	27	68.93	166	13.560	159	18.76	110
Apr. 9.1	27.87	64	50.08	263	51.563	104	16.30	92	58.11	21	67.02	191	13.439	121	17.52	124
19.1	27.33	54	47.11	297	51.503	60	15.38	92	57.97	14	64.90	212	13.367	72	16.24	128
29.1	26.92	41	43.89	322	51.494	9	14.51	87	57.93	4	62.69	221	13.349	18	14.96	128
May 9.0	26.64	28	40.46	343	51.536	— 42	13.75	76	57.96	— 3	60.47	222	13.389	— 40	13.76	120
19.0	26.49	15	36.91	355	51.633	97	13.12	63	58.09	13	58.32	215	13.489	100	12.66	110
29.0	26.48	1	33.32	359	51.782	149	12.66	46	58.30	21	56.30	202	13.645	156	11.72	94
June 7.9	26.61	— 13	29.79	353	51.979	197	12.41	25	58.59	29	54.49	181	13.854	209	10.99	73
17.9	26.89	28	26.39	340	52.220	241	12.35	6	58.97	38	52.94	155	14.113	259	10.47	52
27.9	27.29	40	23.22	317	52.497	277	12.51	— 16	59.40	43	51.71	123	14.413	300	10.19	28
July 7.9	27.80	51	20.34	288	52.807	310	12.86	35	59.88	48	50.79	92	14.746	333	10.15	4
17.8	28.43	63	17.86	248	53.138	331	13.41	55	60.41	53	50.24	55	15.107	361	10.36	— 21
27.8	29.13	70	15.84	202	53.487	349	14.13	72	60.97	56	50.05	19	15.484	377	10.79	43
Aug. 6.8	29.90	77	14.34	150	53.843	356	14.99	86	61.54	57	50.23	— 18	15.873	389	11.43	64
16.8	30.71	81	13.43	91	54.200	357	15.96	97	62.12	58	50.75	52	16.264	391	12.26	83
26.7	31.53	82	13.12	31	54.552	352	17.02	106	62.70	58	51.62	87	16.651	387	13.25	99
Sept. 5.7	32.34	81	13.44	— 32	54.896	344	18.13	111	63.27	57	52.81	119	17.029	378	14.38	113
15.7	33.12	78	14.40	96	55.225	329	19.27	114	63.81	54	54.28	147	17.392	363	15.61	123
25.6	33.84	72	15.94	154	55.535	310	20.42	115	64.33	52	56.02	174	17.736	344	16.92	131
Oct. 5.6	34.46	62	18.03	209	55.825	290	21.55	113	64.81	48	57.99	197	18.057	321	18.29	137
15.6	34.99	53	20.62	259	56.089	264	22.65	110	65.25	44	60.16	217	18.351	294	19.70	141
25.6	35.39	40	23.59	297	56.328	239	23.71	106	65.64	39	62.48	232	18.615	264	21.13	143
Nov. 4.5	35.64	25	26.83	324	56.535	207	24.72	101	65.96	32	64.91	243	18.847	232	22.56	143
14.5	35.77	13	30.23	340	56.709	174	25.68	96	66.23	27	67.41	250	19.041	194	23.97	141
24.5	35.73	— 4	33.66	343	56.847	138	26.57	89	66.43	20	69.91	250	19.193	152	25.34	137
Dec. 4.5	35.54	19	37.01	335	56.946	99	27.38	81	66.56	13	72.37	246	19.302	109	26.64	130
14.4	35.20	34	40.14	313	57.002	56	28.09	71	66.61	5	74.70	233	19.364	62	27.83	119
24.4	34.73	47	42.95	281	57.014	12	28.70	61	66.58	— 3	76.83	213	19.376	12	28.90	107
34.4	34.15	58	45.34	239	56.983	— 31	29.19	49	66.48	10	78.71	188	19.340	— 36	29.79	89
Mean Place	31.478		47.94		50.870		6.39		57.839		50.38		12.766		5.65	
Sec δ, Tan δ	3.740		−3.604		1.175		+0.616		2.054		+1.794		1.301		+0.832	
$D_\psi \alpha$, $D_\omega \alpha$	−0.02		+0.13		+0.07		−0.02		+0.10		−0.06		+0.08		−0.03	
$D_\psi \delta$, $D_\omega \delta$	+0.2		+0.8		+0.2		+0.8		+0.2		+0.8		+0.2		+0.8	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ξ Persei. Mag. 4.0				γ Eridani. Mag. 3.2				λ Tauri. Var. 3.3–4.2				δ Reticuli. Mag. 4.4			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 3 53		° ′ +35 33		h m 3 54		° ′ −13 44		h m 3 56		° ′ +12 15		h m 3 57		° ′ −61 37	
	s		″		s		″		s		″		s		″	
Jan. 0.4	32.821		15.12		8.454		45.32		3.400		22.68		27.44		77.27	
10.4	32.765	56	15.73	61	8.391	63	46.81	149	3.359	41	22.22	46	27.14	30	79.56	229
20.3	32.667	98	16.15	42	8.296	95	48.06	125	3.282	77	21.76	46	26.78	36	81.34	178
30.3	32.531	136	16.35	20	8.170	126	49.07	101	3.173	109	21.32	44	26.37	41	82.60	126
Feb. 9.3	32.364	167	16.34	— 1	8.022	148	49.79	72	3.040	133	20.89	43	25.93	44	83.30	70
19.3	32.178	186	16.08	26	7.856	166	50.24	45	2.889	151	20.48	41	25.47	46	83.44	14
29.2	31.983	195	15.62	46	7.684	172	50.38	14	2.729	160	20.11	37	25.01	46	83.01	— 43
Mar. 10.2	31.790	193	14.94	68	7.513	171	50.23	— 15	2.570	159	19.78	33	24.56	45	82.03	98
20.2	31.612	178	14.09	85	7.354	159	49.79	44	2.422	148	19.51	27	24.13	43	80.54	149
30.1	31.462	150	13.12	97	7.215	139	49.05	74	2.296	126	19.32	19	23.74	39	78.57	197
Apr. 9.1	31.349	113	12.06	106	7.105	110	48.05	100	2.199	97	19.23	9	23.40	34	76.18	239
19.1	31.281	68	10.97	109	7.031	74	46.76	129	2.140	59	19.27	— 4	23.12	28	73.43	275
29.1	31.264	17	9.91	106	6.998	33	45.22	154	2.123	17	19.45	18	22.91	21	70.37	306
May 9.0	31.302	— 38	8.92	99	7.009	— 11	43.47	175	2.152	— 29	19.79	34	22.78	13	67.08	329
19.0	31.397	95	8.06	86	7.066	57	41.52	195	2.227	75	20.29	50	22.73	5	63.61	347
29.0	31.546	149	7.37	69	7.168	102	39.41	211	2.348	121	20.96	67	22.76	— 3	60.06	355
June 7.9	31.745	199	6.85	52	7.314	146	37.21	220	2.513	165	21.79	83	22.87	11	56.52	354
17.9	31.991	246	6.56	29	7.498	184	34.95	226	2.717	204	22.76	97	23.06	19	53.06	346
27.9	32.275	284	6.48	8	7.718	220	32.69	226	2.954	237	23.85	109	23.33	27	49.79	327
July 7.9	32.593	318	6.63	— 15	7.967	249	30.49	220	3.220	266	25.03	118	23.66	33	46.79	300
17.8	32.937	344	6.98	35	8.239	272	28.43	206	3.507	287	26.27	124	24.05	39	44.13	266
27.8	33.296	359	7.53	55	8.527	288	26.55	188	3.810	303	27.51	124	24.49	44	41.91	222
Aug. 6.8	33.665	369	8.26	73	8.825	298	24.93	162	4.121	311	28.73	122	24.96	47	40.18	173
16.8	34.037	372	9.13	87	9.128	303	23.61	132	4.434	313	29.87	114	25.45	49	39.01	117
26.7	34.406	369	10.12	99	9.428	300	22.63	98	4.744	310	30.92	105	25.95	50	38.43	58
Sept. 5.7	34.765	359	11.21	109	9.720	292	22.03	60	5.045	301	31.82	90	26.44	49	38.49	— 6
15.7	35.109	344	12.38	117	10.000	280	21.84	19	5.336	291	32.56	74	26.92	48	39.18	69
25.6	35.437	328	13.59	121	10.263	263	22.05	— 21	5.611	275	33.12	56	27.36	44	40.49	131
Oct. 5.6	35.742	305	14.81	122	10.507	244	22.65	60	5.866	255	33.50	38	27.76	40	42.36	187
15.6	36.023	281	16.04	123	10.726	219	23.61	96	6.101	235	33.68	18	28.10	34	44.75	239
25.6	36.275	252	17.27	123	10.922	196	24.90	129	6.312	211	33.71	3	28.38	28	47.56	281
Nov. 4.5	36.497	222	18.47	120	11.087	165	26.43	153	6.498	186	33.59	— 12	28.59	21	50.70	314
14.5	36.684	187	19.62	115	11.223	136	28.17	174	6.656	158	33.34	25	28.72	13	54.05	335
24.5	36.832	148	20.73	111	11.325	102	30.02	185	6.781	125	33.00	34	28.77	5	57.47	342
Dec. 4.5	36.939	107	21.77	104	11.393	68	31.92	190	6.873	92	32.58	42	28.73	— 4	60.86	339
14.4	37.002	63	22.72	95	11.423	30	33.79	187	6.929	56	32.13	45	28.62	11	64.09	323
24.4	37.018	16	23.56	84	11.417	— 6	35.57	178	6.946	17	31.65	48	28.43	19	67.04	295
34.4	36.987	— 31	24.24	68	11.375	42	37.18	161	6.925	— 21	31.17	48	28.16	27	69.62	258
Mean Place	30.643		1.17		6.591		48.28		1.481		13.87		24.627		72.59	
Sec δ, Tan δ	1.229		+0.715		1.029		−0.245		1.024		+0.217		2.105		−1.852	
$D_\psi \alpha$, $D_\omega \alpha$	+0.08		−0.03		+0.06		+0.01		+0.07		−0.01		+0.02		+0.06	
$D_\psi \delta$, $D_\omega \delta$	+0.2		+0.9		+0.2		+0.9		+0.2		+0.9		+0.2		+0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	*ν* Tauri. Mag. 3.9				A Tauri. Mag. 4.5				*c* Persei. Mag. 4.0				*p* Tauri. Mag. 5.6			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	3 58		+ 5 45		3 59		+21 51		4 2		+47 29		4 5		+26 15	
	s		″		s		″		s		″		s		″	
Jan. 0.4	43.087		32.70		45.609		22.84		36.050		37.25		44.826		57.05	
10.4	43.047	40	31.95	75	45.570	39	22.78	6	35.980	70	38.44	119	44.789	37	57.26	21
20.3	42.970	77	31.27	68	45.492	78	22.68	10	35.856	124	39.38	94	44.712	77	57.35	9 —
30.3	42.865	105	30.66	61	45.381	111	22.51	17	35.685	171	40.01	63	44.598	114	57.33	2
Feb. 9.3	42.731	134	30.13	53	45.242	139	22.24	27	35.477	208	40.31	30 —	44.456	142	57.19	14
19.3	42.581	150	29.70	43	45.084	158	21.91	33	35.243	234	40.28	3	44.291	165	56.92	27
29.2	42.422	159	29.36	34	44.915	169	21.51	40	34.998	245	39.89	39	44.115	176	56.54	38
Mar. 10.2	42.264	158	29.15	21	44.748	167	21.05	46	34.755	243	39.18	71	43.940	175	56.04	50
20.2	42.116	148	29.05	10 —	44.592	156	20.54	51	34.528	227	38.18	100	43.775	165	55.46	58
30.1	41.989	127	29.08	3	44.459	133	20.03	51	34.333	195	36.93	125	43.632	143	54.82	64
Apr. 9.1	41.889	100	29.28	20	44.357	102	19.54	49	34.181	152	35.49	144	43.522	110	54.17	65
19.1	41.826	63	29.63	35	44.293	64	19.12	42	34.082	99	33.93	156	43.452	70	53.54	63
29.1	41.804	22 —	30.15	52	44.274	19 —	18.78	34	34.043	39 —	32.31	162	43.427	25 —	52.97	57
May 9.0	41.827	23	30.86	71	44.302	28	18.57	21	34.069	26	30.71	160	43.451	24	52.49	48
19.0	41.895	68	31.73	87	44.381	79	18.48	9 —	34.161	92	29.18	153	43.525	74	52.14	35
29.0	42.009	114	32.77	104	44.508	127	18.57	9	34.317	156	27.78	140	43.649	124	51.95	19
June 8.0	42.165	156	33.96	119	44.679	171	18.83	26	34.534	217	26.58	120	43.821	172	51.92	3 —
17.9	42.360	195	35.27	131	44.892	213	19.25	42	34.807	273	25.58	100	44.036	215	52.08	16
27.9	42.588	228	36.67	140	45.141	249	19.82	57	35.129	322	24.84	74	44.288	252	52.40	32
July 7.9	42.845	257	38.11	144	45.421	280	20.55	73	35.490	361	24.36	48	44.572	284	52.89	49
17.8	43.123	278	39.57	146	45.723	302	21.39	84	35.884	394	24.17	19 —	44.880	308	53.51	62
27.8	43.417	294	40.99	142	46.040	317	22.32	93	36.301	417	24.23	6	45.205	325	54.26	75
Aug. 6.8	43.721	304	42.32	133	46.366	326	23.31	99	36.731	430	24.57	34	45.540	335	55.10	84
16.8	44.025	304	43.51	119	46.697	331	24.32	101	37.167	436	25.15	58	45.879	339	56.01	91
26.7	44.328	303	44.55	104	47.024	327	25.33	101	37.602	435	25.97	82	46.217	338	56.94	93
Sept. 5.7	44.624	296	45.38	83	47.344	320	26.29	96	38.029	427	26.98	101	46.549	332	57.88	94
15.7	44.909	285	45.98	60	47.652	308	27.17	88	38.441	412	28.19	121	46.868	319	58.80	92
25.7	45.178	269	46.35	37	47.944	292	27.98	81	38.836	395	29.55	136	47.175	307	59.66	86
Oct. 5.6	45.429	251	46.47	12 —	48.218	274	28.68	70	39.207	371	31.04	149	47.462	287	60.48	82
15.6	45.660	231	46.36	11	48.469	251	29.28	60	39.549	342	32.66	162	47.727	265	61.23	75
25.6	45.867	207	46.03	33	48.698	229	29.79	51	39.857	308	34.35	169	47.969	242	61.91	68
Nov. 4.5	46.049	182	45.54	49	48.898	200	30.20	41	40.129	272	36.09	174	48.184	215	62.52	61
14.5	46.202	153	44.90	64	49.070	172	30.52	32	40.357	228	37.87	178	48.368	184	63.09	57
24.5	46.324	122	44.14	76	49.209	139	30.74	22	40.540	183	39.64	177	48.518	150	63.58	49
Dec. 4.5	46.414	90	43.32	82	49.312	103	30.93	19	40.672	132	41.36	172	48.632	114	64.02	44
14.4	46.467	53	42.48	84	49.377	65	31.06	13	40.747	75	42.99	163	48.705	73	64.39	37
24.4	46.483	16 —	41.64	84	49.401	24 —	31.11	5 —	40.766	19 —	44.49	150	48.735	30 —	64.71	32
34.4	46.462	21	40.84	80	49.383	18	31.10	1	40.728	38	45.81	132	48.723	12	64.94	23
Mean Place	41.191		25.40		43.595		11.97		33.497		21.59		42.728		45.53	
Sec δ, Tan δ	1.005		+0.101		1.077		+0.401		1.480		+1.091		1.115		+0.494	
$D_\psi \alpha$, $D_\omega \alpha$	+0.06		0.00		+0.07		−0.01		+0.09		−0.04		+0.07		−0.02	
$D_\psi \delta$, $D_\omega \delta$	+0.2		+0.9		+0.2		+0.9		+0.2		+0.9		+0.2		+0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	o^1 **Eridani.** Mag. 4.1				μ **Tauri.** Mag. 4.3				α **Horologii.** Mag. 3.8				α **Reticuli.** Mag. 3.4			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	4 7		− 7 2		4 10		+ 8 40		4 11		−42 29		4 13		−62 40	
	s		″		s		″		s		″		s		″	
Jan. 0.4	47.763		76.33		60.246		65.93		15.262		66.46		23.23		65.95	
10.4	47.718	45	77.63	130	60.215	31	65.30	63	15.131	131	68.79	233	22.94	29	68.41	246
20.3	47.637	81	78.76	113	60.146	69	64.70	60	14.958	173	70.71	192	22.58	36	70.41	200
30.3	47.525	112	79.69	93	60.045	101	64.16	54	14.748	210	72.18	147	22.17	41	71.90	149
Feb. 9.3	47.388	137	80.41	72	59.915	130	63.68	48	14.509	239	73.17	99	21.72	45	72.82	92
19.3	47.233	155	80.91	50	59.765	150	63.27	41	14.250	259	73.66	49	21.24	48	73.18	36
29.2	47.066	167	81.17	26	59.604	161	62.93	34	13.981	269	73.65	1	20.75	49	72.98	20
Mar. 10.2	46.900	166	81.20	3	59.443	161	62.67	26	13.713	268	73.14	51	20.26	49	72.22	76
20.2	46.742	158	80.97	23	59.291	152	62.50	17	13.458	255	72.16	98	19.80	46	70.94	128
30.2	46.602	140	80.52	45	59.157	134	62.44	6	13.225	233	70.74	142	19.37	43	69.18	176
Apr. 9.1	46.490	112	79.82	70	59.050	107	62.50	6	13.026	199	68.89	185	18.99	38	66.95	223
19.1	46.412	78	78.89	93	58.978	72	62.70	20	12.867	159	66.66	223	18.67	32	64.35	260
29.1	46.373	39	77.72	117	58.946	32	63.05	35	12.755	112	64.11	255	18.42	25	61.41	294
May 9.0	46.378	5	76.35	137	58.960	14	63.56	51	12.695	60	61.30	281	18.26	16	58.21	320
19.0	46.428	50	74.78	157	59.018	58	64.24	68	12.691	4	58.27	303	18.17	9	54.82	339
29.0	46.521	93	73.06	172	59.123	105	65.08	84	12.744	53	55.11	316	18.16	1	51.31	351
June 8.0	46.658	137	71.21	185	59.271	148	66.06	98	12.851	107	51.89	322	18.24	8	47.78	353
17.9	46.836	178	69.27	194	59.459	188	67.17	111	13.010	159	48.69	320	18.40	16	44.31	347
27.9	47.048	212	67.31	196	59.681	222	68.38	121	13.219	209	45.58	311	18.65	25	40.98	333
July 7.9	47.289	241	65.36	195	59.933	252	69.64	126	13.470	251	42.64	294	18.96	31	37.90	308
17.9	47.554	265	63.49	187	60.208	275	70.95	131	13.757	287	40.00	264	19.33	37	35.12	278
27.8	47.836	282	61.75	174	60.499	291	72.23	128	14.073	316	37.67	233	19.76	43	32.77	235
Aug. 6.8	48.129	293	60.22	153	60.800	301	73.45	122	14.411	338	35.78	189	20.23	47	30.91	186
16.8	48.428	299	58.92	130	61.107	307	74.58	113	14.762	351	34.38	140	20.72	49	29.57	134
26.7	48.726	298	57.90	102	61.413	306	75.57	99	15.117	355	33.49	89	21.24	52	28.83	74
Sept. 5.7	49.018	292	57.21	69	61.713	300	76.37	80	15.467	350	33.18	31	21.75	51	28.72	11
15.7	49.301	283	56.86	35	62.004	291	76.99	62	15.808	341	33.45	27	22.25	50	29.25	53
25.7	49.570	269	56.86	0	62.282	278	77.38	39	16.131	323	34.30	85	22.72	47	30.40	115
Oct. 5.6	49.820	250	57.22	36	62.544	262	77.57	19	16.429	298	35.71	141	23.15	43	32.13	173
15.6	50.051	231	57.90	68	62.786	242	77.54	3	16.695	266	37.62	191	23.53	38	34.42	229
25.6	50.257	206	58.87	97	63.007	221	77.33	21	16.928	233	39.96	234	23.84	31	37.16	274
Nov. 4.6	50.439	182	60.09	122	63.203	196	76.95	38	17.118	190	42.67	271	24.08	24	40.26	310
14.5	50.592	153	61.49	140	63.370	167	76.44	51	17.264	146	45.61	294	24.24	16	43.60	334
24.5	50.712	120	63.01	152	63.507	137	75.82	62	17.362	98	48.71	310	24.32	8	47.06	346
Dec. 4.5	50.799	87	64.59	158	63.610	103	75.15	67	17.409	47	51.83	312	24.32	0	50.52	346
14.4	50.851	52	66.17	158	63.678	68	74.45	70	17.405	4	54.85	302	24.23	9	53.86	334
24.4	50.864	13	67.69	152	63.708	30	73.74	71	17.351	54	57.69	284	24.05	18	56.95	309
34.4	50.840	24	69.10	141	63.698	10	73.06	68	17.249	102	60.25	256	23.80	25	59.70	275
Mean Place	45.861		80.77		58.288		58.24		13.084		64.63		20.306		62.04	
Sec δ, Tan δ	1.008		−0.124		1.012		+0.153		1.356		−0.916		2.179		−1.936	
$D_\psi \alpha$, $D_\omega \alpha$	+0.06		0.00		+0.06		0.00		+0.04		+0.03		+0.02		+0.06	
$D_\psi \delta$, $D_\omega \delta$	+0.2		+0.9		+0.2		+0.9		+0.2		+0.9		+0.2		+0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Tauri. Mag. 3.9				δ Tauri. Mag. 3.9				υ⁵ Eridani. Mag. 4.1				δ Mensæ. Mag. 5.6			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	4 15		+15 25		4 18		+17 20		4 20		−34 12		4 23		−80 24	
	s		″		s		″		s		″		s		″	
Jan. 0.4	2.684		41.47		7.351		56.41		54.962		41.33		43.77		46.10	
		25		33		24		24		89		224		101		244
10.4	2.659		41.14		7.327		56.17		54.873		43.57		42.76		48.54	
		66		33		64		25		131		189		119		195
20.3	2.593		40.81		7.263		55.92		54.742		45.46		41.57		50.49	
		99		33		99		27		167		150		131		144
30.3	2.494		40.48		7.164		55.65		54.575		46.96		40.26		51.93	
		129		34		130		31		197		108		141		88
Feb. 9.3	2.365		40.14		7.034		55.34		54.378		48.04		38.85		52.81	
		151		35		152		30		217		62		148		35
19.3	2.214		39.79		6.882		55.04		54.161		48.66		37.37		53.16	—
		162		34		165		34		230		16		150		23
29.2	2.052		39.45		6.717		54.70		53.931		48.82	—	35.87		52.93	
		165		34		166		35		230		30		148		77
Mar. 10.2	1.887		39.11		6.551		54.35		53.701		48.52		34.39		52.16	
		157		31		160		34		222		72		143		130
20.2	1.730		38.80		6.391		54.01		53.479		47.80		32.96		50.86	
		138		27		141		33		203		116		134		175
30.2	1.592		38.53		6.250		53.68		53.276		46.64		31.62		49.11	
		110		20		113		27		174		154		121		222
Apr. 9.1	1.482		38.33		6.137		53.41		53.102		45.10		30.41		46.89	
		74		11		77		20		138		191		108		256
19.1	1.408		38.22		6.060		53.21		52.964		43.19		29.33		44.33	
		33		1		35		11		96		221		90		289
29.1	1.375	—	38.21	—	6.025	—	53.10	—	52.868		40.98		28.43		41.44	
		12		13		11		2		48		251		70		314
May 9.0	1.387		38.34		6.036		53.12		52.820	—	38.47		27.73		38.30	
		59		28		57		15		1		273		50		331
19.0	1.446		38.62		6.093		53.27		52.821		35.74		27.23		34.99	
		106		42		105		31		54		288		27		342
29.0	1.552		39.04		6.198		53.58		52.875		32.86		26.96		31.57	
		151		57		150		45		103		297		6		344
June 8.0	1.703		39.61		6.348		54.03		52.978		29.89		26.90	—	28.13	
		191		72		190		59		151		299		17		339
17.9	1.894		40.33		6.538		54.62		53.129		26.90		27.07		24.74	
		228		84		228		73		194		294		38		323
27.9	2.122		41.17		6.766		55.35		53.323		23.96		27.45		21.51	
		259		93		259		84		234		279		59		297
July 7.9	2.381		42.10		7.025		56.19		53.557		21.17		28.04		18.54	
		280		101		282		91		265		258		79		269
17.9	2.661		43.11		7.307		57.10		53.822		18.59		28.83		15.85	
		301		105		302		96		292		229		94		225
27.8	2.962		44.16		7.609		58.06		54.114		16.30		29.77		13.60	
		310		105		312		98		310		192		108		179
Aug. 6.8	3.272		45.21		7.921		59.04		54.424		14.38		30.85		11.81	
		315		100		318		96		322		149		119		127
16.8	3.587		46.21		8.239		60.00		54.746		12.89		32.04		10.54	
		316		94		318		90		327		99		125		69
26.7	3.903		47.15		8.557		60.90		55.073		11.90		33.29		9.85	
		310		83		314		82		326		48		127		6
Sept. 5.7	4.213		47.98		8.871		61.72		55.399		11.42	—	34.56		9.79	—
		301		69		305		70		316		7		126		58
15.7	4.514		48.67		9.176		62.42		55.715		11.49		35.82		10.37	
		288		55		293		58		303		60		119		120
25.7	4.802		49.22		9.469		63.00		56.018		12.09		37.01		11.57	
		273		41		277		45		283		114		109		177
Oct. 5.6	5.075		49.63		9.746		63.45		56.301		13.23		38.10		13.34	
		252		23		258		30		257		163		95		227
15.6	5.327		49.86		10.004		63.75		56.558		14.86		39.05		15.61	
		232		11		238		17		228		206		76		277
25.6	5.559		49.97		10.242		63.92		56.786		16.92		39.81		18.38	
		207		2		212		7		194		241		56		308
Nov. 4.6	5.766		49.95		10.454		63.99	—	56.980		19.33		40.37		21.46	
		178		13		185		3		157		267		32		333
14.5	5.944		49.82		10.639		63.96		57.137		22.00		40.69		24.79	
		148		23		153		10		116		283		7		344
24.5	6.092		49.59		10.792		63.86		57.253		24.83		40.76	—	28.23	
		113		27		118		16		73		288		18		342
Dec. 4.5	6.205		49.32		10.910		63.70		57.326		27.71		40.58		31.65	
		76		31		81		19		27		283		43		333
14.4	6.281		49.01		10.991		63.51		57.353	—	30.54		40.15		34.98	
		36		33		40		22		19		269		67		306
24.4	6.317	—	48.68		11.031		63.29		57.334		33.23		39.48		38.04	
		3		34		0		25		66		244		89		270
34.4	6.314		48.34		11.031		63.04		57.268		35.67		38.59		40.74	
Mean Place	0.665		32.48		5.298		47.12		52.886		41.02		37.125		42.07	
Sec δ, Tan δ	1.038		+0.276		1.048		+0.312		1.209		−0.680		6.002		−5.918	
$D_\psi \alpha$, $D_\omega \alpha$	+0.07		−0.01		+0.07		−0.01		+0.04		+0.02		−0.08		+0.16	
$D_\psi \delta$, $D_\omega \delta$	+0.2		+0.9		+0.2		+0.9		+0.2		+0.9		+0.2		+0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ε Tauri. Mag. 3.6				*m* Persei. Mag. 6.1				α Tauri. (*Aldebaran.*) Mag. 1.1				ν Eridani. Mag. 4.1			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	4 23		+18 59		4 27		+42 53		4 31		+16 20		4 32		− 3 31	
	s		″		s		″		s		″		s		″	
Jan. 0.4	44.677		51.71		32.613		21.50		8.012		37.57		9.217		18.91	
10.4	44.658	19	51.56	15	32.579	34	22.57	107	7.999	13	37.28	29	9.194	23	20.16	125
20.4	44.597	61	51.38	18	32.493	86	23.46	89	7.944	55	37.00	28	9.131	63	21.25	109
30.3	44.501	96	51.18	20	32.358	135	24.11	65	7.853	91	36.71	29	9.035	96	22.19	94
Feb. 9.3	44.372	129	50.93	25	32.183	175	24.51	40	7.728	125	36.41	30	8.907	128	22.93	74
19.3	44.220	152	50.65	28	31.977	206	24.61	10	7.580	148	36.11	30	8.757	150	23.48	55
29.2	44.053	167	50.33	32	31.755	222	24.44	17	7.415	165	35.80	31	8.592	165	23.84	36
Mar. 10.2	43.883	170	49.98	35	31.528	227	23.98	46	7.246	169	35.49	31	8.423	169	23.98	14
20.2	43.721	162	49.62	36	31.311	217	23.25	73	7.084	162	35.19	30	8.260	163	23.92	6
30.2	43.576	145	49.27	35	31.117	194	22.29	96	6.937	147	34.92	27	8.111	149	23.63	29
Apr. 9.1	43.459	117	48.93	34	30.958	159	21.17	112	6.816	121	34.70	22	7.987	124	23.14	49
19.1	43.377	82	48.67	26	30.844	114	19.89	128	6.730	86	34.55	15	7.893	94	22.43	71
29.1	43.337	40	48.48	19	30.784	60	18.55	134	6.683	47	34.49	6	7.837	56	21.53	90
May 9.1	43.343	6	48.40	8	30.782	2	17.21	134	6.681	2	34.54	5	7.824	13	20.41	112
19.0	43.396	53	48.44	4	30.840	58	15.92	129	6.725	44	34.73	19	7.854	30	19.12	129
29.0	43.497	101	48.63	19	30.956	116	14.71	121	6.817	92	35.05	32	7.929	75	17.66	146
June 8.0	43.643	146	48.97	34	31.131	175	13.64	107	6.953	136	35.51	46	8.047	118	16.07	159
17.9	43.831	188	49.44	47	31.359	228	12.74	90	7.132	179	36.10	59	8.205	158	14.38	169
27.9	44.057	226	50.05	61	31.635	276	12.04	70	7.347	215	36.82	72	8.399	194	12.64	174
July 7.9	44.314	257	50.77	72	31.951	316	11.55	49	7.595	248	37.63	81	8.625	226	10.89	175
17.9	44.595	281	51.59	82	32.300	349	11.30	25	7.867	272	38.51	88	8.877	252	9.19	170
27.8	44.897	302	52.46	87	32.675	375	11.26	4	8.159	292	39.43	92	9.147	270	7.60	159
Aug. 6.8	45.210	313	53.36	90	33.067	392	11.43	17	8.466	307	40.35	92	9.432	285	6.15	145
16.8	45.530	320	54.25	89	33.470	403	11.82	39	8.779	313	41.25	90	9.726	294	4.91	124
26.8	45.851	321	55.11	86	33.875	405	12.37	55	9.095	316	42.08	83	10.021	295	3.91	100
Sept. 5.7	46.169	318	55.90	79	34.278	403	13.11	74	9.408	313	42.80	72	10.316	295	3.21	70
15.7	46.479	310	56.58	68	34.673	395	13.98	87	9.714	306	43.42	62	10.605	289	2.81	40
25.7	46.776	297	57.16	58	35.055	382	14.96	98	10.011	297	43.89	47	10.883	278	2.75	6
Oct. 5.6	47.059	283	57.62	46	35.418	363	16.08	112	10.293	282	44.23	34	11.147	264	3.01	26
15.6	47.324	265	57.97	35	35.760	342	17.28	120	10.559	266	44.42	19	11.395	248	3.58	57
25.6	47.569	245	58.19	22	36.076	316	18.55	127	10.805	246	44.48	6	11.623	228	4.43	85
Nov. 4.6	47.789	220	58.32	13	36.359	283	19.90	135	11.027	222	44.42	6	11.827	204	5.51	108
14.5	47.982	193	58.36	4	36.607	248	21.28	138	11.223	196	44.27	15	12.005	178	6.78	127
24.5	48.142	160	58.33	3	36.813	206	22.68	140	11.388	165	44.04	23	12.153	148	8.18	140
Dec. 4.5	48.267	125	58.26	7	36.974	161	24.07	139	11.519	131	43.78	26	12.267	114	9.65	147
14.5	48.355	88	58.16	10	37.083	109	25.42	135	11.612	93	43.48	30	12.344	77	11.12	147
24.4	48.402	47	58.02	14	37.137	54	26.69	127	11.664	52	43.18	30	12.382	38	12.56	144
34.4	48.406	4	57.87	15	37.135	2	27.82	113	11.674	10	42.87	31	12.381	1	13.90	134
Mean Place	42.585		42.29		30.041		8.12		5.918		28.92		7.236		23.92	
Sec δ, Tan δ	1.058		+0.344		1.365		+0.929		1.042		+0.293		1.002		−0.062	
$D_\psi \alpha$, $D_\omega \alpha$	+0.07		−0.01		+0.08		−0.02		+0.07		−0.01		+0.06		0.00	
$D_\psi \delta$, $D_\omega \delta$	+0.2		+0.9		+0.2		+0.9		+0.2		+0.9		+0.1		+0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Doradus. Mag. 3.5				53 Eridani. Mag. 4.0				τ Tauri. Mag. 4.3				Groombridge 848. Mag. 6.0			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 4 32		° ′ −55 12		h m 4 34		° ′ −14 27		h m 4 37		° ′ +22 47		h m 4 37		° ′ +75 47	
	s		″		s		″		s		″		s		″	
Jan. 0.4	13.407	189	68.66	266	21.887	36	59.47	171	14.286	8	57.84	6	36.81	24	41.50	256
10.4	13.218	247	71.32	224	21.851	74	61.18	151	14.278	52	57.90	1	36.57	39	44.06	223
20.4	12.971	296	73.56	176	21.777	110	62.69	124	14.226	92	57.91	4	36.18	53	46.29	182
30.3	12.675	334	75.32	124	21.667	140	63.93	97	14.134	127	57.87	11	35.65	64	48.11	134
Feb. 9.3	12.341	364	76.56	70	21.527	163	64.90	66	14.007	152	57.76	17	35.01	74	49.45	80
19.3	11.977	378	77.26	15	21.364	177	65.56	36	13.855	170	57.59	26	34.27	77	50.25	25
29.3	11.599	381	77.41	39	21.187	182	65.92	6	13.685	178	57.33	32	33.50	79	50.50	33
Mar. 10.2	11.218	370	77.02	92	21.005	177	65.98	25	13.507	170	57.01	38	32.71	75	50.17	86
20.2	10.848	344	76.10	143	20.828	161	65.73	55	13.337	156	56.63	42	31.96	68	49.31	137
30.2	10.504	310	74.67	187	20.667	139	65.18	85	13.181	128	56.21	43	31.28	60	47.94	182
Apr. 9.1	10.194	262	72.80	229	20.528	106	64.33	113	13.053	95	55.78	42	30.68	48	46.12	218
19.1	9.932	208	70.51	266	20.422	69	63.20	139	12.958	53	55.36	37	30.20	33	43.94	245
29.1	9.724	144	67.85	296	20.353	27	61.81	163	12.905	6	54.99	29	29.87	16	41.49	265
May 9.1	9.580	79	64.89	319	20.326	17	60.18	183	12.899	42	54.70	18	29.71	0	38.84	274
19.0	9.501	9	61.70	333	20.343	63	58.35	200	12.941	90	54.52	8	29.71	16	36.10	273
29.0	9.492	60	58.37	343	20.406	107	56.35	215	13.031	137	54.44	6	29.87	34	33.37	266
June 8.0	9.552	127	54.94	343	20.513	147	54.20	220	13.168	181	54.50	21	30.21	48	30.71	249
18.0	9.679	195	51.51	333	20.660	185	52.00	224	13.349	220	54.71	33	30.69	62	28.22	226
27.9	9.874	252	48.18	313	20.845	219	49.76	219	13.569	253	55.04	45	31.31	74	25.96	196
July 7.9	10.126	304	45.05	288	21.064	245	47.57	208	13.822	279	55.49	57	32.05	87	24.00	164
17.9	10.430	349	42.17	251	21.309	269	45.49	191	14.101	302	56.06	64	32.92	95	22.36	126
27.8	10.779	384	39.66	207	21.578	282	43.58	167	14.403	316	56.70	71	33.87	101	21.10	87
Aug. 6.8	11.163	409	37.59	156	21.860	293	41.91	140	14.719	324	57.41	72	34.88	106	20.23	47
16.8	11.572	425	36.03	100	22.153	297	40.51	104	15.043	328	58.13	71	35.94	109	19.76	4
26.8	11.997	429	35.03	38	22.450	298	39.47	66	15.371	327	58.84	68	37.03	111	19.72	38
Sept. 5.7	12.426	423	34.65	23	22.748	290	38.81	26	15.698	321	59.52	64	38.14	109	20.10	79
15.7	12.849	405	34.88	87	23.038	281	38.55	17	16.019	311	60.16	57	39.23	106	20.89	118
25.7	13.254	379	35.75	147	23.319	266	38.72	57	16.330	297	60.73	48	40.29	101	22.07	156
Oct. 5.7	13.633	342	37.22	203	23.585	248	39.29	96	16.627	282	61.21	41	41.30	96	23.63	190
15.6	13.975	297	39.25	252	23.833	228	40.25	131	16.909	261	61.62	32	42.26	87	25.53	223
25.6	14.272	244	41.77	293	24.061	201	41.56	163	17.170	239	61.94	25	43.13	76	27.76	250
Nov. 4.6	14.516	184	44.70	321	24.262	173	43.19	183	17.409	210	62.19	19	43.89	64	30.26	271
14.5	14.700	121	47.91	338	24.435	143	45.02	199	17.619	180	62.38	16	44.53	51	32.97	288
24.5	14.821	53	51.29	345	24.578	106	47.01	207	17.799	144	62.54	12	45.04	36	35.85	296
Dec. 4.5	14.874	17	54.74	338	24.684	68	49.08	207	17.943	104	62.66	10	45.40	19	38.81	297
14.5	14.857	85	58.12	320	24.752	29	51.15	199	18.047	61	62.76	8	45.59	3	41.78	288
24.4	14.772	151	61.32	291	24.781	13	53.14	186	18.108	17	62.84	4	45.62	13	44.66	271
34.4	14.621		64.23		24.768		55.00		18.125		62.88		45.49		47.37	
Mean Place	10.814		66.35		19.901		62.58		12.093		48.28		30.341		25.25	
Sec δ, Tan δ	1.753		−1.440		1.033		−0.258		1.085		+0.420		4.075		+3.950	
$D_\psi \alpha$, $D_\omega \alpha$	+0.03		+0.03		+0.05		+0.01		+0.07		−0.01		+0.16		−0.09	
$D_\psi \delta$, $D_\omega \delta$	+0.1		+0.9		+0.1		+0.9		+0.1		+0.9		+0.1		+0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Coeli. Mag. 4.5				4 Camelop. Mag. 5.4				μ Eridani. Mag. 4.2				π³ Orionis. Mag. 3.3			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	4 37		−42 0		4 41		+56 36		4 41		− 3 24		4 45		+ 6 48	
	s		″		s		″		s		″		s		″	
Jan. 0.4	53.428		86.97		3.342		47.95		20.098		22.89		18.788		62.91	
10.4	53.326	102	89.53	256	3.294	48	49.74	179	20.082	16	24.17	128	18.783	5	62.10	81
20.4	53.175	151	91.71	218	3.173	121	51.28	154	20.026	56	25.29	112	18.739	44	61.40	70
30.3	52.982	193	93.47	176	2.985	188	52.52	124	19.934	92	26.26	97	18.655	84	60.77	63
Feb. 9.3	52.754	228	94.76	129	2.743	242	53.40	88	19.811	123	27.02	76	18.539	116	60.25	52
19.3	52.500	254	95.57	81	2.459	284	53.90	50	19.663	148	27.60	58	18.398	141	59.81	44
29.3	52.230	270	95.88	31	2.147	312	53.98	8	19.499	164	27.98	38	18.240	158	59.48	33
Mar. 10.2	51.957	273	95.69	19	1.828	319	53.64	34	19.330	169	28.15	17	18.074	166	59.25	23
20.2	51.691	266	95.02	67	1.519	309	52.90	74	19.164	166	28.11	4	17.912	162	59.12	13
30.2	51.443	248	93.89	113	1.235	284	51.80	110	19.011	153	27.85	26	17.763	149	59.12	0
Apr. 9.1	51.222	221	92.32	157	0.996	239	50.39	141	18.882	129	27.39	46	17.636	127	59.24	12
19.1	51.038	184	90.35	197	0.814	182	48.72	167	18.781	101	26.71	68	17.539	97	59.51	27
29.1	50.898	140	88.03	232	0.697	117	46.88	184	18.719	62	25.84	87	17.480	59	59.91	40
May 9.1	50.808	90	85.41	262	0.656	41	44.93	195	18.697	22	24.76	108	17.463	17	60.45	54
19.0	50.772	36	82.53	288	0.691	35	42.95	198	18.719	22	23.50	126	17.490	27	61.16	71
29.0	50.791	19	79.48	305	0.805	114	41.01	194	18.785	66	22.08	142	17.561	71	62.00	84
June 8.0	50.865	74	76.32	316	0.995	190	39.16	185	18.895	110	20.53	155	17.677	116	62.97	97
18.0	50.992	127	73.14	318	1.254	259	37.48	168	19.045	150	18.87	166	17.833	156	64.05	108
27.9	51.168	176	70.02	312	1.580	326	35.99	149	19.231	186	17.16	171	18.025	192	65.23	118
July 7.9	51.389	221	67.03	299	1.960	380	34.75	124	19.450	219	15.44	172	18.250	225	66.44	121
17.9	51.650	261	64.26	277	2.388	428	33.76	99	19.695	245	13.78	166	18.503	253	67.69	125
27.8	51.944	294	61.81	245	2.853	465	33.07	69	19.962	267	12.20	158	18.775	272	68.89	120
Aug. 6.8	52.263	319	59.74	207	3.346	493	32.67	40	20.243	281	10.76	144	19.062	287	70.03	114
16.8	52.600	337	58.13	161	3.857	511	32.57	10	20.534	291	9.54	122	19.360	298	71.05	102
26.8	52.948	348	57.03	110	4.379	522	32.76	19	20.829	295	8.56	98	19.661	301	71.91	86
Sept. 5.7	53.298	350	56.49	54	4.902	523	33.23	47	21.125	296	7.87	69	19.963	302	72.59	68
15.7	53.643	345	56.53	4	5.419	517	33.97	74	21.415	290	7.46	41	20.260	297	73.07	48
25.7	53.976	333	57.17	64	5.922	503	34.96	99	21.696	281	7.41	5	20.550	290	73.30	23
Oct. 5.7	54.291	315	58.39	122	6.405	483	36.20	124	21.966	270	7.68	27	20.829	279	73.29	1
15.6	54.580	289	60.13	174	6.862	457	37.65	145	22.219	253	8.26	58	21.090	261	73.08	21
25.6	54.838	258	62.35	222	7.285	423	39.30	165	22.453	234	9.11	85	21.337	247	72.66	42
Nov. 4.6	55.058	220	64.97	262	7.667	382	41.11	181	22.665	212	10.21	110	21.560	223	72.06	60
14.5	55.236	178	67.89	292	8.001	334	43.06	195	22.851	186	11.50	129	21.759	199	71.32	74
24.5	55.367	131	70.98	309	8.277	276	45.10	204	23.007	156	12.91	141	21.927	168	70.47	85
Dec. 4.5	55.450	83	74.17	319	8.492	215	47.19	209	23.129	122	14.40	149	22.065	138	69.57	90
14.5	55.481	31	77.32	315	8.636	144	49.28	209	23.215	86	15.90	150	22.164	99	68.66	91
24.4	55.459	22	80.34	302	8.708	72	51.30	202	23.263	48	17.37	147	22.225	61	67.76	90
34.4	55.383	76	83.09	275	8.702	6	53.19	189	23.269	6	18.74	137	22.242	17	66.91	85
Mean Place	51.195		86.21		0.023		33.72		18.093		27.84		16.727		56.31	
Sec δ, Tan δ	1.346		−0.901		1.818		+1.517		1.002		−0.060		1.007		+0.120	
$D_\psi \alpha$, $D_\omega \alpha$	+0.04		+0.02		+0.10		−0.03		+0.06		0.00		+0.06		0.00	
$D_\psi \delta$, $D_\omega \delta$	+0.1		+0.9		+0.1		+0.9		+0.1		+0.9		+0.1		+0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	**9 Camelop.** Mag. 4.4				**i Tauri.** Mag. 5.1				**π^5 Orionis.** Mag. 3.9				**ι Aurigæ.** Mag. 2.9			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	4 45		+66 12		4 46		+18 41		4 49		+ 2 18		4 51		+33 2	
	s		″		s		″		s		″		s		″	
Jan. 0.4	45.81		20.67		29.680		60.83		54.556		20.54		33.686		13.44	
10.4	45.72	9	22.91	224	29.678	2	60.66	17	54.552	4	19.51	103	33.690	4	14.06	62
20.4	45.55	17	24.88	197	29.634	44	60.48	18	54.506	46	18.59	92	33.642	48	14.58	52
30.3	45.26	29	26.48	160	29.550	84	60.30	18	54.422	84	17.80	79	33.548	94	14.99	41
Feb. 9.3	44.91	35	27.67	119	29.431	119	60.10	20	54.306	116	17.15	65	33.414	134	15.24	25
19.3	44.50	41	28.41	74	29.285	146	59.89	21	54.164	142	16.64	51	33.247	167	15.34	10
29.3	44.06	44	28.64	23	29.121	164	59.63	26	54.003	161	16.27	37	33.060	187	15.26	8
Mar. 10.2	43.60	46	28.39	25	28.948	173	59.35	28	53.834	169	16.06	21	32.863	197	14.99	27
20.2	43.16	44	27.66	73	28.778	170	59.06	29	53.670	164	16.00	6	32.670	193	14.56	43
30.2	42.75	41	26.48	118	28.624	154	58.77	29	53.516	154	16.09	9	32.491	179	13.98	58
Apr. 9.2	42.40	35	24.91	157	28.494	130	58.50	27	53.385	131	16.36	27	32.339	152	13.28	70
19.1	42.12	28	23.02	189	28.396	98	58.27	23	53.283	102	16.78	42	32.224	115	12.50	78
29.1	41.94	18	20.88	214	28.337	59	58.10	17	53.218	65	17.37	59	32.152	72	11.68	82
May 9.1	41.85	9	18.59	229	28.321	16	58.03	7	53.194	24	18.15	78	32.130	22	10.86	82
19.0	41.86	1	16.21	238	28.352	31	58.06	3	53.213	19	19.08	93	32.159	29	10.08	78
29.0	41.97	11	13.83	238	28.431	79	58.22	16	53.277	64	20.16	108	32.242	83	9.39	69
June 8.0	42.20	23	11.53	230	28.555	124	58.50	28	53.383	106	21.38	122	32.375	133	8.80	59
18.0	42.51	31	9.38	215	28.722	167	58.89	39	53.531	148	22.70	132	32.557	182	8.34	46
27.9	42.91	40	7.43	195	28.927	205	59.41	52	53.716	185	24.10	140	32.782	225	8.03	31
July 7.9	43.39	48	5.75	168	29.165	238	60.02	61	53.931	215	25.52	142	33.045	263	7.87	16
17.9	43.93	54	4.34	141	29.430	265	60.72	70	54.173	242	26.94	142	33.340	295	7.85	2
27.9	44.53	60	3.27	107	29.717	287	61.47	75	54.439	266	28.30	136	33.659	319	7.97	12
Aug. 6.8	45.17	64	2.54	73	30.020	303	62.22	75	54.719	280	29.56	126	33.996	337	8 22	25
16.8	45.85	68	2.16	38	30.333	313	62.97	75	55.010	291	30.65	109	34.347	351	8.58	36
26.8	46.54	69	2.13	3	30.650	317	63.67	70	55.307	297	31.58	93	34.704	357	9.02	44
Sept. 5.7	47.22	68	2.46	33	30.968	318	64.31	64	55.604	297	32.25	67	35.061	357	9.54	52
15.7	47.91	69	3.14	68	31.283	315	64.84	53	55.898	294	32.66	41	35.415	354	10.10	56
25.7	48.58	67	4.14	100	31.590	307	65.28	44	56.184	286	32.81	15	35.761	346	10.70	60
Oct. 5.7	49.23	65	5.47	133	31.884	294	65.60	32	56.460	276	32.68	13	36.095	334	11.32	62
15.6	49.84	61	7.10	163	32.164	280	65.80	20	56.721	261	32.29	39	36.414	319	11.96	64
25.6	50.41	57	8.98	188	32.426	262	65.89	9	56.965	244	31.65	64	36.713	299	12.62	66
Nov. 4.6	50.92	51	11.10	212	32.665	239	65.89	0	57.188	223	30.81	84	36.989	276	13.29	67
14.5	51.36	44	13.41	231	32.879	214	65.81	8	57.386	198	29.81	100	37.236	247	13.97	68
24.5	51.72	36	15.87	246	33.064	185	65.67	14	57.554	168	28.69	112	37.446	210	14.68	71
Dec. 4.5	51.99	27	18.41	254	33.213	149	65.51	16	57.691	137	27.49	120	37.619	173	15.39	71
14.5	52.17	18	20.97	256	33.323	110	65.33	18	57.791	100	26.29	120	37.748	129	16.08	60
24.4	52.25	8	23.46	249	33.392	69	65.14	19	57.850	59	25.13	116	37.829	81	16.75	67
34.4	52.22	3	25.81	235	33.418	26	64.94	20	57.869	19	24.03	110	37.860	31	17.39	64
Mean Place	41.488		5.88		27.503		52.33		52.504		14.77		31.252		3.02	
Sec δ, Tan δ	2.478		+2.268		1.056		+0.338		1.001		+0.040		1.193		+0.650	
$D_\phi\alpha$, $D_\omega\alpha$	+0.12		−0.05		+0.07		−0.01		+0.06		0.00		+0.08		−0.01	
$D_\phi\delta$, $D_\omega\delta$	+0.1		*+0.9*		*+0.1*		+0.9		+0.1		+1.0		+0.1		+1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ε Aurigæ. Var. 3.0–4.5				β Camelop. Mag. 4.2				ζ Aurigæ. Mag. 3.9				ι Tauri. Mag. 4.7		
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declin tion
	h m		° ′		h m		° ′		h m		° ′		h m		°
	4 55		+43 42		4 55		+60 19		4 56		+40 57		4 58		+21
	s		″		s		″		s		″		s		″
Jan. 0.4	59.081		12.16		60.09		28.95		38.884		27.13		6.674		23.55
10.4	59.081	0	13.35	119	60.06	3	30.96	201	38.886	2	28.20	107	6.685	11	23.53
20.4	59.022	59	14.40	105	59.94	12	32.76	180	38.832	54	29.12	92	6.649	36	23.50
30.3	58.909	113	15.27	87	59.74	20	34.25	149	38.725	107	29.86	74	6.572	77	23.45
Feb. 9.3	58.749	160	15.89	62	59.48	26	35.38	113	38.577	148	30.40	54	6.457	115	23.37
19.3	58.552	197	16.25	36	59.17	31	36.11	73	38.391	186	30.70	30	6.312	145	23.24
29.3	58.329	223	16.33	8	58.82	35	36.40	29	38.179	212	30.74	4	6.145	167	23.06
Mar. 10.2	58.096	233	16.11	22	58.46	36	36.24	16	37.957	222	30.53	21	5.969	176	22.83
20.2	57.865	231	15.63	48	58.10	36	35.65	59	37.738	219	30.06	47	5.794	175	22.53
30.2	57.652	213	14.87	76	57.76	34	34.65	100	37.536	202	29.37	69	5.633	161	22.22
Apr. 9.2	57.468	184	13.91	96	57.48	28	33.31	134	37.361	175	28.49	88	5.492	141	21.89
19.1	57.325	143	12.76	115	57.25	23	31.65	166	37.226	135	27.44	105	5.385	107	21.57
29.1	57.233	92	11.50	126	57.09	16	29.76	189	37.137	89	26.31	113	5.316	69	21.28
May 9.1	57.197	36	10.17	133	57.01	8	27.72	204	37.102	35	25.12	119	5.291	25	21.07
19.0	57.219	22	8.83	134	57.01	0	25.60	212	37.125	23	23.93	119	5.312	21	20.93
29.0	57.302	83	7.53	130	57.11	10	23.47	213	37.207	82	22.77	116	5.382	70	20.89
June 8.0	57.444	142	6.33	120	57.28	17	21.41	206	37.343	136	21.71	106	5.497	115	20.96
18.0	57.641	197	5.25	108	57.53	25	19.47	194	37.532	189	20.78	93	5.656	159	21.16
27.9	57.889	248	4.32	93	57.86	33	17.70	177	37.770	238	20.01	77	5.855	199	21.46
July 7.9	58.181	292	3.58	74	58.25	39	16.17	153	38.051	281	19.38	63	6.088	233	21.87
17.9	58.509	328	3.02	56	58.70	45	14.90	127	38.368	317	18.96	42	6.351	263	22.36
27.9	58.869	360	2.66	36	59.19	49	13.89	101	38.713	345	18.72	24	6.637	286	22.92
Aug. 6.8	59.250	381	2.51	15	59.72	53	13.19	70	39.079	366	18.64	8	6.941	304	23.52
16.8	59.648	398	2.53	2	60.27	55	12.80	39	39.462	383	18.73	9	7.256	315	24.12
26.8	60.054	406	2.75	22	60.85	58	12.72	8	39.854	392	18.99	26	7.577	321	24.70
Sept. 5.7	60.463	409	3.13	38	61.42	57	12.95	23	40.248	394	19.38	39	7.901	324	25.24
15.7	60.870	407	3.66	53	62.00	58	13.48	53	40.639	391	19.89	51	8.222	321	25.72
25.7	61.267	397	4.34	68	62.55	55	14.30	82	41.023	384	20.54	65	8.537	315	26.09
Oct. 5.7	61.654	387	5.15	81	63.10	55	15.40	110	41.393	370	21.30	76	8.841	304	26.40
15.6	62.023	369	6.07	92	63.62	52	16.75	135	41.750	357	22.14	84	9.133	292	26.61
25.6	62.369	346	7.10	103	64.10	48	18.35	160	42.083	333	23.06	92	9.408	275	26.74
Nov. 4.6	62.688	319	8.23	113	64.54	44	20.15	180	42.391	308	24.06	100	9.662	254	26.81
14.6	62.974	286	9.45	122	64.94	40	22.13	198	42.666	275	25.12	106	9.891	229	26.82
24.5	63.219	245	10.73	128	65.27	33	24.26	213	42.902	236	26.26	114	10.089	198	26.79
Dec. 4.5	63.418	199	12.05	132	65.52	25	26.47	221	43.096	194	27.43	117	10.253	164	26.75
14.5	63.565	147	13.38	133	65.71	19	28.72	225	43.242	146	28.58	115	10.378	125	26.71
24.4	63.656	91	14.70	132	65.80	9	30.94	222	43.333	91	29.73	115	10.460	82	26.66
34.4	63.688	32	15.94	124	65.81	1	33.04	210	43.369	36	30.82	109	10.496	36	26.62
Mean Place	56.319		0.60		56.349		15.57		36.212		15.99		4.422		15.14
Sec δ, Tan δ	1.383		+0.956		2.020		+1.755		1.324		+0.868		1.075		+0.39
$D_\psi a$, $D_\omega a$	+0.09		−0.02		+0.11		−0.03		+0.08		−0.02		+0.07		−0.01
$D_\psi \delta$, $D_\omega \delta$	+0.1		+1.0		+0.1		+1.0		+0.1		+1.0		+0.1		+1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	11 Orionis. Mag. 4.6				η Aurigæ. Mag. 3.3				ε Leporis. Mag. 3.3				β Eridani. Mag. 2.9			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	4 59		+15 17		5 0		+41 7		5 1		−22 28		5 3		− 5 11	
	s		″		s		″		s		″		s		″	
Jan. 0.4	48.256	9	24.59	36	40.018	8	30.16	107	56.342	26	56.95	218	45.254	1	34.35	144
10.4	48.265	33	24.23	34	40.026	50	31.23	95	56.316	70	59.13	193	45.255	42	35.79	129
20.4	48.232	75	23.89	31	39.976	102	32.18	77	56.246	109	61.06	162	45.213	82	37.08	109
30.4	48.157	112	23.58	29	39.874	149	32.95	58	56.137	143	62.68	129	45.131	116	38.17	90
Feb. 9.3	48.045	141	23.29	26	39.725	184	33.53	33	55.994	172	63.97	94	45.015	143	39.07	67
19.3	47.904	159	23.03	23	39.541	211	33.86	8	55.822	191	64.91	55	44.872	164	39.74	46
29.3	47.745	170	22.80	23	39.330	222	33.94	18	55.631	200	65.46	19	44.708	173	40.20	23
Mar. 10.2	47.575	169	22.57	22	39.108	221	33.76	43	55.431	200	65.65	19	44.535	173	40.43	0
20.2	47.406	158	22.35	20	38.887	205	33.33	68	55.231	188	65.46	56	44.362	162	40.43	22
30.2	47.248	136	22.15	14	38.682	178	32.65	87	55.043	168	64.90	90	44.200	143	40.21	45
Apr. 9.2	47.112	106	22.01	7	38.504	139	31.78	102	54.875	140	64.00	125	44.057	115	39.76	68
19.1	47.006	70	21.94	1	38.365	92	30.76	114	54.735	103	62.75	155	43.942	81	39.08	88
29.1	46.936	28	21.93	10	38.273	39	29.62	120	54.632	63	61.20	182	43.861	41	38.20	109
May 9.1	46.908	19	22.03	20	38.234	18	28.42	121	54.569	18	59.38	208	43.820	1	37.11	127
19.1	46.927	63	22.23	33	38.252	76	27.21	115	54.551	26	57.30	225	43.819	45	35.84	144
29.0	46.990	109	22.56	43	38.328	132	26.06	108	54.577	73	55.05	241	43.864	87	34.40	157
June 8.0	47.099	150	22.99	55	38.460	186	24.98	96	54.650	116	52.64	249	43.951	129	32.83	169
18.0	47.249	189	23.54	64	38.646	236	24.02	82	54.766	157	50.15	252	44.080	166	31.14	173
27.9	47.438	222	24.18	73	38.882	277	23.20	65	54.923	192	47.63	246	44.246	199	29.41	174
July 7.9	47.660	251	24.91	79	39.159	315	22.55	48	55.115	226	45.17	235	44.445	228	27.67	170
17.9	47.911	274	25.70	81	39.474	344	22.07	29	55.341	252	42.82	215	44.673	252	25.97	160
27.9	48.185	291	26.51	79	39.818	365	21.78	12	55.593	272	40.67	189	44.925	269	24.37	144
Aug. 6.8	48.476	302	27.30	74	40.183	381	21.66	4	55.865	288	38.78	156	45.194	282	22.93	123
16.8	48.778	310	28.04	67	40.564	390	21.70	21	56.153	298	37.22	117	45.476	290	21.70	98
26.8	49.088	312	28.71	58	40.954	394	21.91	35	56.451	302	36.05	74	45.766	293	20.72	68
Sept. 5.8	49.400	308	29.29	46	41.348	392	22.26	47	56.753	300	35.31	27	46.059	292	20.04	36
15.7	49.708	303	29.75	30	41.740	386	22.73	59	57.053	296	35.04	22	46.351	287	19.68	2
25.7	50.011	296	30.05	14	42.126	375	23.32	71	57.349	286	35.26	69	46.638	278	19.66	34
Oct. 5.7	50.307	281	30.19	1	42.501	357	24.03	80	57.635	270	35.95	115	46.916	266	20.00	66
15.6	50.588	265	30.20	12	42.858	338	24.83	89	57.905	250	37.10	157	47.182	248	20.66	96
25.6	50.853	245	30.08	26	43.196	311	25.72	97	58.155	228	38.67	193	47.430	230	21.62	123
Nov. 4.6	51.098	221	29.82	34	43.507	282	26.69	104	58.383	200	40.60	221	47.660	204	22.85	143
14.6	51.319	192	29.48	39	43.789	244	27.73	110	58.583	165	42.81	241	47.864	175	24.28	157
24.5	51.511	158	29.09	44	44.033	199	28.83	115	58.748	128	45.22	253	48.039	144	25.85	167
Dec. 4.5	51.669	119	28.65	44	44.232	151	29.98	117	58.876	86	47.75	254	48.183	106	27.52	168
14.5	51.788	81	28.21	42	44.383	95	31.15	115	58.962	44	50.29	248	48.289	66	29.20	163
24.5	51.869	34	27.79	40	44.478	41	32.30	110	59.006	1	52.77	232	48.355	24	30.83	154
34.4	51.903		27.39		44.519		33.40		59.007		55.09		48.379		32.37	
Mean Place	46.076		17.13		37.321		19.26		54.273		59.19		43.198		38.82	
Sec δ, Tan δ	1.037		+0.273		1.328		+0.873		1.082		−0.414		1.004		−0.091	
$D_\phi\alpha$, $D_\omega\alpha$	+0.07		0.00		+0.08		−0.02		+0.05		+0.01		+0.06		0.00	
$D_\phi\delta$, $D_\omega\delta$	+0.1		+1.0		+0.1		+1.0		+0.1		+1.0		+0.1		+1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	μ Aurigæ. Mag. 4.8				19 H. Camelop. Mag. 5.2				μ Leporis. Mag. 3.3				α Aurigæ. (Capella.) Mag. 0.2			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	5 7		+38 23		5 8		+79 8		5 9		−16 17		5 10		+45 54	
	s		″		s		″		s		″		s		″	
Jan. 0.4	43.282	18	20.13	93	50.28	20	28.13	283	11.529	9	71.80	197	31.802	16	60.53	133
10.4	43.300	— 38	21.06	84	50.08	41	30.96	256	11.520	52	73.77	175	31.818	— 47	61.86	119
20.4	43.262	90	21.90	69	49.67	61	33.52	220	11.468	92	75.52	149	31.771	106	63.05	102
30.4	43.172	136	22.59	52	49.06	78	35.72	176	11.376	131	77.01	119	31.665	157	64.07	79
Feb. 9.3	43.036	174	23.11	31	48.28	91	37.48	126	11.245	154	78.20	90	31.508	199	64.86	52
19.3	42.862	198	23.42	10	47.37	100	38.74	69	11.091	177	79.10	58	31.309	228	65.38	23
29.3	42.664	214	23.52	— 14	46.37	104	39.43	12	10.914	187	79.68	24	31.081	243	65.61	— 7
Mar. 10.2	42.450	212	23.38	35	45.33	104	39.55	— 47	10.727	189	79.92	— 8	30.838	244	65.54	40
20.2	42.238	199	23.03	57	44.29	98	39.08	100	10.538	178	79.84	41	30.594	231	65.14	68
30.2	42.039	173	22.46	76	43.31	89	38.08	152	10.360	160	79.43	71	30.363	201	64.46	92
Apr. 9.2	41.866	141	21.70	90	42.42	73	36.56	194	10.200	131	78.72	101	30.162	162	63.54	114
19.1	41.725	92	20.80	99	41.69	58	34.62	231	10.069	99	77.71	129	30.000	113	62.40	129
29.1	41.633	43	19.81	105	41.11	38	32.31	258	9.970	57	76.42	155	29.887	58	61.11	140
May 9.1	41.590	— 11	18.76	106	40.73	17	29.73	276	9.913	17	74.87	176	29.829	— 4	59.71	144
19.1	41.601	66	17.70	102	40.56	— 3	26.97	284	9.896	— 27	73.11	196	29.833	65	58.27	143
29.0	41.667	121	16.68	94	40.59	25	24.13	284	9.923	73	71.15	212	29.898	126	56.84	138
June 8.0	41.788	173	15.74	84	40.84	45	21.29	275	9.996	113	69.03	220	30.024	184	55.46	128
18.0	41.961	220	14.90	69	41.29	66	18.54	260	10.109	153	66.83	225	30.208	239	54.18	113
27.9	42.181	263	14.21	56	41.95	82	15.94	237	10.262	190	64.58	220	30.447	284	53.05	98
July 7.9	42.444	297	13.65	41	42.77	97	13.57	208	10.452	220	62.38	214	30.731	325	52.07	80
17.9	42.741	326	13.24	23	43.74	113	11.49	175	10.672	245	60.24	198	31.056	359	51.27	60
27.9	43.067	350	13.01	10	44.87	123	9.74	139	10.917	266	58.26	174	31.415	385	50.67	41
Aug. 6.8	43.417	364	12.91	— 5	46.10	131	8.35	99	11.183	281	56.52	148	31.800	404	50.26	20
16.8	43.781	375	12.96	17	47.41	138	7.36	58	11.464	290	55.04	112	32.204	416	50.06	2
26.8	44.156	379	13.13	30	48.79	141	6.78	15	11.754	296	53.92	74	32.620	423	50.04	— 18
Sept. 5.8	44.535	378	13.43	40	50.20	142	6.63	— 27	12.050	296	53.18	33	33.043	423	50.22	33
15.7	44.913	373	13.83	49	51.62	142	6.90	70	12.346	290	52.85	— 11	33.466	418	50.55	51
25.7	45.286	365	14.32	57	53.04	137	7.60	112	12.636	283	52.96	55	33.884	407	51.06	67
Oct. 5.7	45.651	349	14.89	64	54.41	131	8.72	151	12.919	271	53.51	97	34.291	392	51.73	81
15.6	46.000	332	15.53	73	55.72	121	10.23	188	13.190	252	54.48	137	34.683	372	52.54	94
25.6	46.332	307	16.26	78	56.93	110	12.11	223	13.442	230	55.85	168	35.055	344	53.48	107
Nov. 4.6	46.639	279	17.04	85	58.03	96	14.34	253	13.672	207	57.53	196	35.399	312	54.55	120
14.6	46.918	243	17.89	91	58.99	78	16.87	276	13.879	175	59.49	214	35.711	272	55.75	129
24.5	47.161	202	18.80	95	59.77	60	19.63	292	14.054	139	61.63	226	35.983	225	57.04	137
Dec. 4.5	47.363	156	19.75	98	60.37	39	22.55	303	14.193	102	63.89	228	36.208	171	58.41	140
14.5	47.519	103	20.73	98	60.76	16	25.58	302	14.295	60	66.17	221	36.379	113	59.81	141
24.5	47.622	48	21.71	94	60.92	— 6	28.60	293	14.355	17	68.38	211	36.492	51	61.22	137
34.4	47.670		22.65		60.86		31.53		14.372		70.49		36.543		62.59	
Mean Place	40.639		10.05		41.347		14.63		9.467		74.84		28.877		49.80	
Sec δ, Tan δ	1.276		+0.792		5.307		+5.213		1.042		−0.292		1.437		+1.033	
$D_{\psi}\alpha$, $D_{\omega}\alpha$	+0.08		−0.01		+0.20		−0.08		+0.05		0.00		+0.09		−0.01	
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.1		+1.0		+0.1		+1.0		+0.1		+1.0		+0.1		+1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	**β Orionis.** (*Rigel.*) Mag. 0.3				**λ Aurigæ.** Mag. 4.8				**τ Orionis.** Mag. 3.7				**ο Columbæ.** Mag. 4.9			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	5 10		− 8 17		5 13		+40 1		5 13		− 6 55		5 14		−34 58	
	s		″		s		″		s		″		s		″	
Jan. 0.4	32.073		48.13		16.521		42.10		33.710		59.34		29.318		35.74	
10.4	32.076	3	49.74	161	16.545	24	43.12	102	33.716	6	60.90	156	29.276	42	38.42	268
20.4	32.036	40	51.18	144	16.511	34	44.02	90	33.680	36	62.30	140	29.185	91	40.81	239
30.4	31.955	81	52.41	123	16.423	88	44.80	78	33.603	77	63.49	119	29.049	136	42.83	202
Feb. 9.3	31.839	116	53.42	101	16.288	135	45.40	60	33.491	112	64.47	98	28.873	176	44.46	163
19.3	31.695	144	54.17	75	16.115	173	45.78	38	33.350	141	65.21	74	28.666	207	45.65	119
29.3	31.530	165	54.68	51	15.912	203	45.93	15	33.186	164	65.72	51	28.438	228	46.38	73
Mar. 10.3	31.354	176	54.93	25	15.696	216	45.83	10	33.012	174	65.98	26	28.197	241	46.66	28
20.2	31.177	177	54.93	0	15.478	218	45.49	34	32.837	175	66.00	2	27.955	242	46.48	18
30.2	31.010	167	54.67	26	15.272	206	44.92	57	32.671	166	65.77	23	27.723	232	45.86	62
Apr. 9.2	30.861	149	54.17	50	15.091	181	44.14	78	32.521	150	65.31	46	27.512	211	44.81	105
19.1	30.739	122	53.41	76	14.945	146	43.21	93	32.399	122	64.61	70	27.329	183	43.36	145
29.1	30.651	88	52.43	98	14.846	99	42.16	105	32.309	90	63.69	92	27.183	146	41.53	183
May 9.1	30.600	51	51.22	121	14.796	50	41.03	113	32.258	51	62.55	114	27.081	102	39.37	216
19.1	30.591	9	49.82	140	14.802	6	39.87	116	32.248	10	61.23	132	27.024	57	36.95	242
29.0	30.628	37	48.24	158	14.863	61	38.74	113	32.282	34	59.74	149	27.016	8	34.29	266
June 8.0	30.707	79	46.52	172	14.981	118	37.68	106	32.358	76	58.10	164	27.058	42	31.48	281
18.0	30.826	119	44.71	181	15.151	170	36.71	97	32.477	119	56.36	174	27.149	91	28.57	291
28.0	30.984	158	42.84	187	15.370	219	35.87	84	32.634	157	54.57	179	27.287	138	25.66	291
July 7.9	31.175	191	40.97	187	15.634	264	35.17	70	32.823	189	52.77	180	27.466	179	22.81	285
17.9	31.397	222	39.15	182	15.934	300	34.64	53	33.044	221	51.02	175	27.685	219	20.10	271
27.9	31.643	246	37.45	170	16.262	328	34.26	38	33.288	244	49.38	164	27.937	252	17.63	247
Aug. 6.8	31.908	265	35.92	153	16.617	355	34.04	22	33.552	264	47.89	149	28.215	278	15.47	216
16.8	32.187	279	34.61	131	16.988	371	33.96	8	33.829	277	46.63	126	28.515	300	13.69	178
26.8	32.475	288	33.59	102	17.370	382	34.03	7	34.117	288	45.62	101	28.830	315	12.37	132
Sept. 5.8	32.767	292	32.90	69	17.757	387	34.23	20	34.409	292	44.93	69	29.153	323	11.55	82
15.7	33.060	293	32.55	35	18.147	390	34.54	31	34.701	292	44.58	35	29.479	326	11.27	28
25.7	33.348	288	32.56	1	18.530	383	34.96	42	34.990	289	44.58	0	29.801	322	11.55	28
Oct. 5.7	33.629	281	32.96	40	18.906	376	35.49	53	35.272	282	44.95	37	30.114	313	12.41	86
15.6	33.898	269	33.72	76	19.268	362	36.11	62	35.542	270	45.67	72	30.410	296	13.79	138
25.6	34.150	252	34.80	108	19.612	344	36.81	70	35.796	254	46.69	102	30.685	275	15.67	188
Nov. 4.6	34.383	233	36.16	136	19.933	321	37.61	80	36.032	236	48.01	132	30.932	247	17.98	231
14.6	34.591	208	37.76	160	20.224	291	38.48	87	36.243	211	49.54	153	31.147	215	20.63	265
24.5	34.772	181	39.51	175	20.479	255	39.43	95	36.427	184	51.24	170	31.323	176	23.53	290
Dec. 4.5	34.919	147	41.36	185	20.693	214	40.43	100	36.577	150	53.02	178	31.457	134	26.59	306
14.5	35.029	110	43.23	187	20.859	166	41.48	105	36.691	114	54.83	181	31.545	88	29.67	308
24.5	35.099	70	45.05	182	20.971	112	42.53	105	36.765	74	56.59	176	31.582	37	32.67	300
34.4	35.126	27	46.78	173	21.029	58	43.56	103	36.796	31	58.25	166	31.571	11	35.52	285
Mean Place	30.009		52.14		13.803		32.22		31.639		63.50		27.134		36.96	
Sec δ, Tan δ	1.011		−0.146		1.306		+0.840		1.007		−0.122		1.220		−0.699	
$D_\psi\alpha$, $D_\omega\alpha$	+0.06		0.00		+0.08		−0.01		+0.06		0.00		+0.04		+0.01	
$D_\psi\delta$, $D_\omega\delta$	+0.1		*+1.0*		*+0.1*		+1.0		+0.1		+1.0		+0.1		+1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	*γ* **Orionis.** (*Bellatrix.*) Mag. 1.7				*β* **Tauri.** Mag. 1.8				**17 Camelop.** Mag. 5.8				*β* **Leporis.** Mag. 3.0			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	5 20		+ 6 16		5 20		+28 32		5 22		+62 59		5 24		−20 49	
	s		″		s		″		s		″		s		″	
Jan. 0.4	39.645	24	33.75	90	61.290	34	23.41	37	18.22	1	66.15	222	40.863	2	29.47	225
10.4	39.669	20	32.85	81	61.324	18	23.78	35	18.23	9	68.37	204	40.861	48	31.72	201
20.4	39.649	62	32.04	68	61.306	65	24.13	31	18.14	18	70.41	178	40.813	90	33.73	173
30.4	39.587	100	31.36	57	61.241	109	24.44	22	17.96	27	72.19	145	40.723	128	35.46	143
Feb. 9.3	39.487	131	30.79	47	61.132	144	24.66	13	17.69	32	73.64	106	40.595	160	36.89	106
19.3	39.356	154	30.32	35	60.988	172	24.79	2	17.37	37	74.70	63	40.435	182	37.95	72
29.3	39.202	168	29.97	22	60.816	185	24.81	10	17.00	40	75.33	17	40.253	195	38.67	35
Mar. 10.3	39.034	170	29.75	13	60.631	189	24.71	24	16.60	40	75.50	29	40.058	198	39.02	0
20.2	38.864	161	29.62	0	60.442	181	24.47	34	16.20	38	75.21	73	39.860	192	39.02	37
30.2	38.703	145	29.62	11	60.261	159	24.13	43	15.82	35	74.48	114	39.668	174	38.65	71
Apr. 9.2	38.558	118	29.73	25	60.102	129	23.70	51	15.47	29	73.34	150	39.494	150	37.94	105
19.1	38.440	85	29.98	37	59.973	92	23.19	55	15.18	21	71.84	179	39.344	117	36.89	134
29.1	38.355	48	30.35	51	59.881	48	22.64	56	14.97	13	70.05	202	39.227	78	35.55	164
May 9.1	38.307	4	30.86	66	59.833	1	22.08	53	14.84	6	68.03	216	39.149	37	33.91	188
19.1	38.303	39	31.52	77	59.834	50	21.55	48	14.78	4	65.87	224	39.112	8	32.03	209
29.0	38.342	82	32.29	90	59.884	98	21.07	40	14.82	12	63.63	224	39.120	52	29.94	225
June 8.0	38.424	123	33.19	100	59.982	145	20.67	32	14.94	23	61.39	217	39.172	94	27.69	235
18.0	38.547	161	34.19	107	60.127	187	20.35	20	15.17	30	59.22	204	39.266	136	25.34	240
28.0	38.708	195	35.26	112	60.314	226	20.15	10	15.47	37	57.18	187	39.402	174	22.94	237
July 7.9	38.903	224	36.38	113	60.540	258	20.05	1	15.84	44	55.31	165	39.576	206	20.57	229
17.9	39.127	250	37.51	109	60.798	287	20.04	8	16.28	50	53.66	140	39.782	235	18.28	211
27.9	39.377	267	38.60	103	61.085	307	20.12	16	16.78	54	52.26	111	40.017	258	16.17	190
Aug. 6.8	39.644	283	39.63	90	61.392	322	20.28	23	17.32	57	51.15	81	40.275	275	14.27	158
16.8	39.927	292	40.53	74	61.714	334	20.51	26	17.89	61	50.34	51	40.550	289	12.69	121
26.8	40.219	296	41.27	56	62.048	339	20.77	27	18.50	61	49.83	19	40.839	297	11.48	82
Sept. 5.8	40.515	299	41.83	34	62.387	341	21.04	28	19.11	63	49.64	10	41.136	299	10.66	36
15.7	40.814	296	42.17	11	62.728	338	21.32	28	19.74	62	49.74	46	41.435	298	10.30	12
25.7	41.110	290	42.28	14	63.066	332	21.60	26	20.36	61	50.20	76	41.733	292	10.42	58
Oct. 5.7	41.400	281	42.14	36	63.398	322	21.86	24	20.97	59	50.96	106	42.025	281	11.00	105
15.7	41.681	267	41.78	57	63.720	306	22.10	24	21.56	56	52.01	133	42.306	263	12.05	147
25.6	41.948	249	41.21	77	64.026	288	22.34	23	22.12	52	53.34	159	42.569	245	13.52	183
Nov. 4.6	42.197	228	40.44	90	64.314	264	22.57	25	22.64	46	54.93	183	42.814	218	15.35	215
14.6	42.425	200	39.54	100	64.578	234	22.82	26	23.10	41	56.76	204	43.032	189	17.50	236
24.5	42.625	169	38.54	106	64.812	198	23.08	28	23.51	33	58.80	219	43.221	152	19.86	250
Dec. 4.5	42.794	133	37.48	106	65.010	157	23.36	32	23.84	23	60.99	229	43.373	112	22.36	254
14.5	42.927	93	36.42	104	65.167	111	23.68	34	24.07	16	63.28	232	43.485	70	24.90	250
24.5	43.020	49	35.38	97	65.278	62	24.02	36	24.23	6	65.60	227	43.555	24	27.40	238
34.4	43.069		34.41		65.340		24.38		24.29		67.87		43.579		29.78	
Mean Place	37.494		28.16		58.844		15.30		13.983		54.93		38.769		32.17	
Sec *δ*, Tan *δ*	1.006		+0.110		1.138		+0.544		2.203		+1.963		1.070		−0.380	
$D_\psi \alpha$, $D_\omega \alpha$	+0.06		0.00		+0.08		−0.01		+0.11		−0.02		+0.05		0.00	
$D_\psi \delta$, $D_\omega \delta$	+0.1		+1.0		+0.1		+1.0		+0.1		+1.0		+0.1		+1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	χ Aurigæ. Mag. 4.9				δ Orionis. Mag. 2.5				Groombridge 966. Mag. 6.4				α Leporis. Mag. 2.7			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	5 27		+32 7		5 27		− 0 21		5 28		+74 59		5 29		−17 52	
	s		″		s		″		s		″		s		″	
Jan. 0.5	18.114	39	59.57	58	44.995	25	32.80	128	36.04	4	36.99	274	3.605	7	50.95	213
10.4	18.153	13	60.15	57	45.020	19	34.08	114	36.00	22	39.73	253	3.612	39	53.08	193
20.4	18.140	66	60.72	49	45.001	61	35.22	99	35.78	36	42.26	224	3.573	82	55.01	166
30.4	18.074	109	61.21	39	44.940	99	36.21	82	35.42	49	44.50	184	3.491	121	56.67	137
Feb. 9.3	17.965	147	61.60	27	44.841	131	37.03	63	34.93	61	46.34	140	3.370	151	58.04	104
19.3	17.818	176	61.87	13	44.710	154	37.66	46	34.32	70	47.74	89	3.219	176	59.08	71
29.3	17.642	192	62.00	5	44.556	169	38.12	27	33.62	73	48.63	34	3.043	189	59.79	37
Mar. 10.3	17.450	197	61.95	20	44.387	172	38.39	10	32.89	74	48.97	20	2.854	193	60.16	4
20.2	17.253	190	61.75	35	44.215	166	38.49	8	32.15	71	48.77	74	2.661	187	60.20	30
30.2	17.063	168	61.40	49	44.049	150	38.41	27	31.44	66	48.03	124	2.474	170	59.90	63
Apr. 9.2	16.895	140	60.91	58	43.899	124	38.14	44	30.78	57	46.79	169	2.304	146	59.27	93
19.2	16.755	100	60.33	66	43.775	94	37.70	63	30.21	45	45.10	206	2.158	114	58.34	124
29.1	16.655	55	59.67	71	43.681	55	37.07	79	29.76	31	43.04	235	2.044	76	57.10	150
May 9.1	16.600	7	58.96	71	43.626	15	36.28	96	29.45	17	40.69	257	1.968	36	55.60	175
19.1	16.593	44	58.25	68	43.611	28	35.32	112	29.28	2	38.12	268	1.932	8	53.85	194
29.0	16.637	93	57.57	61	43.639	70	34.20	124	29.26	14	35.44	273	1.940	52	51.91	212
June 8.0	16.730	142	56.96	54	43.709	111	32.96	135	29.40	29	32.71	269	1.992	93	49.79	221
18.0	16.872	186	56.42	45	43.820	149	31.61	141	29.69	43	30.02	257	2.085	133	47.58	227
28.0	17.058	226	55.97	34	43.969	182	30.20	144	30.12	57	27.45	239	2.218	171	45.31	225
July 7.9	17.284	262	55.63	24	44.151	214	28.76	143	30.69	69	25.06	215	2.389	204	43.06	219
17.9	17.546	289	55.39	12	44.365	238	27.33	135	31.38	79	22.91	188	2.593	230	40.87	202
27.9	17.835	313	55.27	3	44.603	259	25.98	124	32.17	88	21.03	155	2.823	255	38.85	181
Aug. 6.9	18.148	331	55.24	3	44.862	273	24.74	107	33.05	94	19.48	120	3.078	271	37.04	153
16.8	18.479	343	55.27	14	45.135	285	23.67	87	33.99	100	18.28	82	3.349	285	35.51	119
26.8	18.822	351	55.41	17	45.420	291	22.80	62	34.99	104	17.46	44	3.634	292	34.32	83
Sept. 5.8	19.173	353	55.58	20	45.711	294	22.18	33	36.03	105	17.02	3	3.926	297	33.49	34
15.7	19.526	352	55.78	24	46.005	292	21.85	4	37.08	106	16.99	37	4.223	296	33.15	8
25.7	19.878	346	56.02	26	46.297	287	21.81	27	38.14	104	17.36	76	4.519	290	33.23	53
Oct. 5.7	20.224	336	56.28	30	46.584	279	22.08	55	39.18	100	18.12	116	4.809	280	33.76	96
15.7	20.560	323	56.58	31	46.863	266	22.63	84	40.18	94	19.28	152	5.089	265	34.72	138
25.6	20.883	302	56.89	36	47.129	249	23.47	106	41.12	88	20.80	186	5.354	248	36.10	173
Nov. 4.6	21.185	278	57.25	37	47.378	228	24.53	125	42.00	78	22.66	219	5.602	222	37.83	203
14.6	21.463	250	57.62	44	47.606	201	25.78	139	42.78	65	24.85	244	5.824	193	39.86	224
24.6	21.713	212	58.06	50	47.807	169	27.17	146	43.43	54	27.29	266	6.017	159	42.10	237
Dec. 4.5	21.925	166	58.56	53	47.976	134	28.63	148	43.97	38	29.95	278	6.176	120	44.47	241
14.5	22.091	123	59.09	55	48.110	94	30.11	145	44.35	21	32.73	283	6.296	77	46.88	238
24.5	22.214	70	59.64	56	48.204	51	31.56	137	44.56	6	35.56	280	6.373	33	49.26	226
34.4	22.284		60.20		48.255		32.93		44.62		38.36		6.406		51.52	
Mean Place	15.567		51.48		42.873		37.50		29.055		25.67		1.511		53.95	
Sec δ, Tan δ	1.181		+0.628		1.000		−0.006		3.862		+3.730		1.050		−0.323	
Dψ α, Dω α	+0.08		−0.01		+0.06		0.00		+0.16		−0.03		+0.05		0.00	
Dψ δ, Dω δ	+0.1		+1.0		+0.1		+1.0		+0.1		+1.0		+0.1		+1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	φ¹ Orionis. Mag. 4.5				ι Orionis. Mag. 2.9				ε Orionis. Mag. 1.8				ζ Tauri. Mag. 3.0			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 5 30		° ′ + 9 26		h m 5 31		° ′ − 5 57		h m 5 31		° ′ − 1 15		h m 5 32		° ′ +21 5	
	s		″		s		″		s		″		s		″	
Jan. 0.5	14.679		6.39		21.529		47.06		59.156		12.12		39.780		38.74	
10.4	14.714	35	5.65	74	21.553	24	48.65	159	59.184	28	13.46	134	39.824	44	38.66	8
20.4	14.703	11	4.99	66	21.531	22	50.07	142	59.168	16	14.66	120	39.818	6	38.63	3
30.4	14.649	54	4.43	56	21.468	63	51.30	123	59.109	59	15.70	104	39.766	52	38.61	2
Feb. 9.3	14.557	92	3.95	48	21.365	103	52.32	102	59.013	96	16.56	86	39.672	94	38.59	2
19.3	14.430	127	3.57	38	21.232	133	53.10	78	58.883	130	17.22	66	39.541	131	38.55	4
29.3	14.279	151	3.28	29	21.074	158	53.66	56	58.729	154	17.71	49	39.383	158	38.48	7
Mar. 10.3	14.112	167	3.07	21	20.902	172	53.98	32	58.560	169	18.00	29	39.210	173	38.38	10
20.2	13.942	170	2.94	13	20.726	176	54.07	9	58.387	173	18.10	10	39.031	179	38.23	15
30.2	13.778	164	2.90	4	20.555	171	53.92	15	58.221	166	18.02	8	38.859	172	38.04	19
Apr. 9.2	13.629	149	2.94	4	20.400	155	53.55	37	58.068	153	17.74	28	38.704	155	37.82	22
19.2	13.506	123	3.08	14	20.270	130	52.95	60	57.941	127	17.28	46	38.576	128	37.60	22
29.1	13.415	91	3.33	25	20.169	101	52.13	82	57.844	97	16.63	65	38.481	95	37.38	22
May 9.1	13.362	53	3.68	35	20.107	62	51.11	102	57.785	59	15.80	83	38.426	55	37.19	19
19.1	13.351	11	4.15	47	20.084	23	49.88	123	57.766	19	14.81	99	38.416	10	37.06	13
29.0	13.383	32	4.73	58	20.104	20	48.50	138	57.790	24	13.66	115	38.452	36	36.99	7
June 8.0	13.458	75	5.42	69	20.166	62	46.98	152	57.855	65	12.38	128	38.534	82	37.00	1
18.0	13.575	117	6.21	79	20.269	103	45.34	164	57.962	107	11.01	137	38.659	125	37.09	9
28.0	13.731	156	7.07	86	20.409	140	43.64	170	58.105	143	9.56	145	38.826	167	37.27	18
July 7.9	13.921	190	7.98	91	20.585	176	41.93	171	58.284	179	8.09	147	39.028	202	37.53	26
17.9	14.142	221	8.90	92	20.791	206	40.27	166	58.494	210	6.63	146	39.262	234	37.85	32
27.9	14.388	246	9.82	92	21.023	232	38.69	158	58.728	234	5.25	138	39.524	262	38.21	36
Aug. 6.9	14.654	266	10.68	86	21.277	254	37.25	144	58.984	256	3.98	127	39.806	282	38.59	38
16.8	14.935	281	11.45	77	21.546	269	36.03	122	59.255	271	2.90	108	40.104	298	38.97	38
26.8	15.227	292	12.09	64	21.828	282	35.05	98	59.538	283	2.02	88	40.416	312	39.32	35
Sept. 5.8	15.526	299	12.57	48	22.117	289	34.38	67	59.827	289	1.40	62	40.733	317	39.61	29
15.7	15.828	302	12.86	29	22.409	292	34.03	35	60.120	293	1.07	33	41.054	321	39.83	22
25.7	16.128	300	12.96	10	22.700	291	34.03	0	60.413	293	1.04	3	41.374	320	39.97	14
Oct. 5.7	16.424	296	12.85	11	22.986	286	34.38	35	60.701	288	1.33	29	41.690	316	40.02	5
15.7	16.712	288	12.53	32	23.265	279	35.09	71	60.981	280	1.93	60	41.997	307	39.98	4
25.6	16.988	276	12.03	50	23.531	266	36.10	101	61.249	268	2.79	86	42.293	296	39.87	11
Nov. 4.6	17.246	258	11.36	67	23.779	248	37.40	130	61.500	251	3.91	112	42.573	280	39.69	18
14.6	17.485	239	10.58	78	24.007	228	38.92	152	61.730	230	5.21	130	42.830	257	39.49	20
24.6	17.697	212	9.72	86	24.207	200	40.61	169	61.934	204	6.65	144	43.061	231	39.26	23
Dec. 4.5	17.877	180	8.81	91	24.376	169	42.38	177	62.107	173	8.17	152	43.259	198	39.04	22
14.5	18.023	146	7.91	90	24.507	131	44.19	181	62.245	138	9.72	155	43.419	160	38.85	19
24.5	18.128	105	7.03	88	24.600	93	45.97	178	62.341	96	11.23	151	43.536	117	38.70	15
34.4	18.188	60	6.22	81	24.649	49	47.64	167	62.395	54	12.66	143	43.607	71	38.58	12
Mean Place	12.485		0.76		19.425		51.16		57.032		16.65		37.435		32.05	
Sec δ, Tan δ	1.014		+0.166		1.005		−0.104		1.000		−0.022		1.072		+0.386	
Dψ α, Dω α	+0.07		0.00		+0.06		0.00		+0.06		0.00		+0.07		0.00	
Dψ δ, Dω δ	+0.1		+1.0		0.0		+1.0		0.0		+1.0		0.0		+1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ζ Orionis. Mag. 2.0				α Columbæ. Mag. 2.8				o Aurigæ. Mag. 5.5				ζ Leporis. Mag. 3.7			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 5 36		° ′ − 1 58		h m 5 36		° ′ −34 6		h m 5 39		° ′ +49 47		h m 5 43		° ′ −14 50	
	s		″		s		″		s		″		s		″	
Jan. 0.5	33.326	31	66.13	140	38.634	17	64.08	280	26.710	52	35.30	159	11.031	24	65.50	206
10.4	33.357	13	67.53	126	38.617	68	66.88	252	26.762	18	36.89	150	11.055	22	67.56	188
20.4	33.344	56	68.79	108	38.549	116	69.40	220	26.744	86	38.39	135	11.033	67	69.44	163
30.4	33.288	94	69.87	89	38.433	158	71.60	181	26.658	148	39.74	113	10.966	106	71.07	137
Feb. 9.3	33.194	128	70.76	71	38.275	193	73.41	141	26.510	198	40.87	88	10.860	140	72.44	106
19.3	33.066	152	71.47	50	38.082	220	74.82	95	26.312	236	41.75	56	10.720	166	73.50	75
29.3	32.914	169	71.97	31	37.862	235	75.77	50	26.076	262	42.31	23	10.554	181	74.25	44
Mar. 10.3	32.745	174	72.28	12	37.627	240	76.27	5	25.814	269	42.54	10	10.373	189	74.69	13
20.2	32.571	167	72.40	9	37.387	235	76.32	40	25.545	261	42.44	44	10.184	183	74.82	19
30.2	32.404	154	72.31	29	37.152	218	75.92	83	25.284	240	42.00	75	10.001	170	74.63	48
Apr. 9.2	32.250	130	72.02	47	36.934	194	75.09	123	25.044	203	41.25	102	9.831	149	74.15	79
19.2	32.120	100	71.55	67	36.740	159	73.86	162	24.841	156	40.23	125	9.682	117	73.36	106
29.1	32.020	63	70.88	84	36.581	119	72.24	196	24.685	100	38.98	143	9.565	82	72.30	131
May 9.1	31.957	23	70.04	101	36.462	76	70.28	226	24.585	38	37.55	154	9.483	42	70.99	156
19.1	31.934	18	69.03	118	36.386	28	68.02	251	24.547	24	36.01	160	9.441	2	69.43	175
29.0	31.952	60	67.85	130	36.358	20	65.51	270	24.571	90	34.41	162	9.439	43	67.68	191
June 8.0	32.012	101	66.55	140	36.378	67	62.81	281	24.661	152	32.79	157	9.482	83	65.77	203
18.0	32.113	139	65.15	147	36.445	114	60.00	287	24.813	211	31.22	148	9.565	123	63.74	209
28.0	32.252	175	63.68	149	36.559	157	57.13	283	25.024	265	29.74	136	9.688	160	61.65	210
July 7.9	32.427	205	62.19	147	36.716	196	54.30	271	25.289	311	28.38	121	9.848	191	59.55	204
17.9	32.632	230	60.72	140	36.912	230	51.59	252	25.600	353	27.17	105	10.039	221	57.51	192
27.9	32.862	253	59.32	128	37.142	261	49.07	223	25.953	386	26.12	84	10.260	244	55.59	171
Aug. 6.9	33.115	269	58.04	110	37.403	284	46.84	189	26.339	411	25.28	64	10.504	263	53.88	148
16.8	33.384	280	56.94	89	37.687	304	44.95	145	26.750	431	24.64	45	10.767	278	52.40	116
26.8	33.664	288	56.05	62	37.991	315	43.50	96	27.181	445	24.19	24	11.045	287	51.24	79
Sept. 5.8	33.952	293	55.43	33	38.306	323	42.54	43	27.626	451	23.95	5	11.332	293	50.45	40
15.7	34.245	293	55.10	2	38.629	323	42.11	13	28.077	453	23.90	18	11.625	295	50.05	2
25.7	34.538	289	55.08	32	38.952	318	42.24	68	28.530	448	24.08	35	11.920	291	50.07	46
Oct. 5.7	34.827	281	55.40	61	39.270	306	42.92	124	28.978	438	24.43	56	12.211	285	50.53	88
15.7	35.108	270	56.01	89	39.576	289	44.16	174	29.416	421	24.99	75	12.496	272	51.41	128
25.6	35.378	253	56.90	116	39.865	266	45.90	220	29.837	397	25.74	94	12.768	255	52.69	162
Nov. 4.6	35.631	234	58.06	134	40.131	238	48.10	257	30.234	365	26.68	112	13.023	235	54.31	191
14.6	35.865	207	59.40	149	40.369	201	50.67	285	30.599	326	27.80	127	13.258	206	56.22	212
24.6	36.072	176	60.89	158	40.570	161	53.52	303	30.925	278	29.07	141	13.464	175	58.34	225
Dec. 4.5	36.248	141	62.47	161	40.731	114	56.55	311	31.203	222	30.48	152	13.639	136	60.59	231
14.5	36.389	101	64.08	157	40.845	64	59.66	306	31.425	159	32.00	158	13.775	96	62.90	228
24.5	36.490	56	65.65	149	40.909	13	62.72	293	31.584	91	33.58	159	13.871	50	65.18	219
34.4	36.546		67.14		40.922		65.65		31.675		35.17		13.921		67.37	
Mean Place	31.200		70.51		36.437		66.00		23.462		26.62		8.926		68.79	
Sec δ, Tan δ	1.001		−0.035		1.208		−0.677		1.549		+1.183		1.035		−0.265	
$D_\psi \alpha$, $D_\omega \alpha$	+0.06		0.00		+0.04		0.00		+0.09		−0.01		+0.05		0.00	
$D_\psi \delta$, $D_\omega \delta$	0.0		+1.0		0.0		+1.0		0.0		+1.0		0.0		+1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	κ Orionis. Mag. 2.2				δ Doradus. Mag. 4.5				ν Aurigæ. Mag. 4.2				δ Lep Mag.	
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.	
	h m 5 43		° ′ − 9 41		h m 5 44		° ′ −65 45		h m 5 45		° ′ +39 7		h m 5 47	
	s		″		s		″		s		″		s	
Jan. 0.5	48.451		51.41		40.53		60.22		42.843		37.81		44.620	
		31		182		18		336		61		99		20
10.4	48.482	—	53.23		40.35		63.58		42.904		38.80		44.640	—
		15		165		27		306		2		95		27
20.4	48.467		54.88		40.08		66.64		42.906	—	39.75		44.613	
		59		143		36		268		55		88		73
30.4	48.408		56.31		39.72		69.32		42.851		40.63		44.540	
		98		119		43		223		108		75		113
Feb. 9.4	48.310		57.50		39.29		71.55		42.743		41.38		44.427	
		133		94		50		171		153		59		147
19.3	48.177		58.44		38.79		73.26		42.590		41.97		44.280	
		158		66		54		121		186		39		176
29.3	48.019		59.10		38.25		74.47		42.404		42.36		44.104	
		174		41		56		64		209		17		192
Mar 10.3	47.845		59.51		37.69		75.11		42.195		42.53	—	43.912	
		181		12		57		9		218		6		198
20.2	47.664		59.63	—	37.12		75.20	—	41.977		42.47		43.714	
		177		14		56		45		213		30		196
30.2	47.487		59.49		36.56		74.75		41.764		42.17		43.518	
		162		39		54		96		196		50		183
Apr. 9.2	47.325		59.10		36.02		73.79		41.568		41.67		43.335	
		142		66		50		146		166		70		160
19.2	47.183		58.44		35.52		72.33		41.402		40.97		43.175	
		111		89		45		191		127		84		130
29.1	47.072		57.55		35.07		70.42		41.275		40.13		43.045	
		75		113		37		234		82		95		96
May 9.1	46.997		56.42		34.70		68.08		41.193		39.18		42.949	
		36		133		30		267		31		103		55
19.1	46.961	—	55.09		34.40		65.41		41.162	—	38.15		42.894	
		5		152		22		298		23		105		13
29.1	46.966		53.57		34.18		62.43		41.185		37.10		42.881	—
		46		167		13		318		77		105		30
June 8.0	47.012		51.90		34.05		59.25		41.262		36.05		42.911	
		88		178		4		333		129		100		74
18.0	47.100		50.12		34.01	—	55.92		41.391		35.05		42.985	
		127		184		6		337		179		92		114
28.0	47.227		48.28		34.07		52.55		41.570		34.13		43.099	
		162		186		14		331		223		82		153
July 7.9	47.389		46.42		34.21		49.24		41.793		33.31		43.252	
		194		182		23		318		264		71		185
17.9	47.583		44.60		34.44		46.06		42.057		32.60		43.437	
		222		170		31		295		297		60		218
27.9	47.805		42.90		34.75		43.11		42.354		32.00		43.655	
		244		155		39		262		324		48		242
Aug. 6.9	48.049		41.35		35.14		40.49		42.678		31.52		43.897	
		263		133		44		219		348		36		264
16.8	48.312		40.02		35.58		38.30		43.026		31.16		44.161	
		276		105		50		171		363		23		279
26.8	48.588		38.97		36.08		36.59		43.389		30.93		44.440	
		285		72		54		113		374		14		291
Sept. 5.8	48.873		38.25		36.62		35.46		43.763		30.79		44.731	
		292		37		56		51		381		3		298
15.8	49.165		37.88	—	37.18		34.95	—	44.144		30.76	—	45.029	
		292		1		56		13		383		7		300
25.7	49.457		37.89		37.74		35.08		44.527		30.83		45.329	
		290		40		56		78		380		17		298
Oct. 5.7	49.747		38.29		38.30		35.86		44.907		31.00		45.627	
		283		78		54		145		373		27		291
15.7	50.030		39.07		38.84		37.31		45.280		31.27		45.918	
		272		114		49		204		361		37		279
25.6	50.302		40.21		39.33		39.35		45.641		31.64		46.197	
		256		144		43		255		342		46		261
Nov. 4.6	50.558		41.65		39.76		41.90		45.983		32.10		46.458	
		236		171		37		300		317		57		239
14.6	50.794		43.36		40.13		44.90		46.300		32.67		46.697	
		208		188		28		337		287		69		209
24.6	51.002		45.24		40.41		48.27		46.587		33.36		46.906	
		178		200		19		357		248		78		176
Dec. 4.5	51.180		47.24		40.60		51.84		46.835		34.14		47.082	
		143		205		9		369		202		87		137
14.5	51.323		49.29		40.69	—	55.53		47.037		35.01		47.219	
		100		202		1		366		150		93		95
24.5	51.423		51.31		40.68		59.19		47.187		35.94		47.314	
		56		193		12		352		95		96		47
34.5	51.479		53.24		40.56		62.71		47.282		36.90		47.361	
Mean Place	46.341		55.07		37.210		61.35		40.041		30.42		42.504	
Sec δ, Tan δ	1.015		−0.171		2.436		−2.222		1.289		+0.813		1.070	
Dψ a, Dω a	+0.06		0.00		0.00		+0.01		+0.08		0.00		+0.05	
Dψ δ, Dω δ	0.0		+1.0		0.0		+1.0		0.0		+1.0		0.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Orionis. (*Betelgeux.*) Var. 1.0–1.4				η Leporis. Mag. 3.8				δ Aurigæ. Mag. 3.9				β Aurigæ. Mag. 2.1			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	5 50		+ 7 23		5 52		−14 10		5 52		+54 16		5 53		+44 56	
	s		″		s		″		s		″		s		″	
Jan. 0.5	39.646	54	37.25	91	36.840	33	52.73	207	40.285	71	54.94	182	25.118	72	31.81	132
10.4	39.700	7	36.34	81	36.873	— 13	54.80	189	40.356	— 8	56.76	176	25.190	5	33.13	128
20.4	39.707	— 41	35.53	68	36.860	58	56.69	165	40.348	84	58.52	159	25.195	— 57	34.41	117
30.4	39.666	82	34.85	57	36.802	98	58.34	139	40.264	154	60 11	140	25.138	116	35.58	104
Feb. 9.4	39.584	117	34.28	44	36.704	134	59.73	110	40.110	212	61.51	111	25.022	166	36.62	83
19.3	39.467	144	33.84	34	36.570	161	60.83	79	39.898	259	62.62	78	24.856	206	37.45	58
29.3	39 323	164	33.50	21	36.409	179	61.62	49	39.639	288	63.40	42	24.650	230	38.03	30
Mar. 10.3	39.159	171	33.29	13	36.230	186	62.11	17	39.351	301	63.82	4	24.420	242	38.33	2
20.3	38.988	167	33.16	2	36.044	184	62.28	— 14	39.050	298	63.86	— 34	24.178	238	38.35	— 28
30.2	38.821	155	33.14	— 9	35.860	172	62.14	42	38.752	277	63.52	70	23.940	221	38.07	54
Apr. 9.2	38.666	133	33.23	20	35.688	151	61.72	73	38.475	239	62.82	102	23.719	192	37.53	79
19.2	38.533	103	33.43	30	35.537	122	60.99	99	38.236	191	61.80	130	23.527	150	36.74	100
29.1	38.430	68	33.73	42	35.415	88	60.00	125	38.045	133	60.50	153	23.377	101	35.74	117
May 9.1	38.362	27	34.15	53	35.327	49	58.75	148	37.912	68	58.97	170	23.276	46	34.57	127
19.1	38.335	— 13	34.68	65	35.278	8	57.27	169	37.844	— 1	57.27	180	23.230	— 11	33.30	134
29.1	38.348	56	35.33	76	35.270	— 34	55.58	185	37.845	72	55.47	184	23.241	69	31.96	137
June 8.0	38.404	96	36.09	84	35.304	75	53.73	196	37.917	140	53.63	184	23.310	127	30.59	134
18.0	38.500	135	36.93	91	35.379	115	51.77	204	38.057	205	51.79	177	23.437	180	29.25	128
28.0	38.635	170	37.84	95	35.494	152	49.73	204	38.262	266	50.02	166	23.617	230	27.97	118
July 7.9	38.805	202	38.79	96	35.646	183	47.69	200	38.528	319	48.36	153	23.847	274	26.79	107
17.9	39.007	229	39.75	93	35.829	214	45.69	189	38.847	366	46.83	136	24.121	312	25.72	94
27.9	39.236	251	40.68	86	36.043	237	43.80	170	39.213	406	45.47	116	24.433	345	24.78	80
Aug. 6.9	39.487	268	41.54	75	36.280	258	42.10	146	39.619	439	44.31	95	24.778	369	23.98	63
16.8	39.755	282	42.29	62	36.538	273	40.64	116	40.058	463	43.36	72	25.147	389	23.35	49
26.8	40.037	291	42.91	43	36.811	285	39.48	80	40.521	480	42.64	51	25.536	405	22.86	33
Sept. 5.8	40.328	297	43.34	23	37.096	291	38.68	42	41.001	492	42.13	25	25.941	412	22.53	17
15.8	40.625	300	43.57	0	37.387	294	38.26	0	41.493	498	41.88	3	26.353	416	22.36	2
25.7	40.925	298	43.57	23	37.681	293	38.26	44	41.991	496	41.85	— 23	26.769	416	22.34	— 13
Oct. 5.7	41.223	293	43.34	44	37.974	288	38.70	84	42.487	486	42.08	45	27.185	409	22.47	29
15.7	41.516	284	42.90	65	38.262	277	39.54	124	42.973	471	42.53	71	27.594	395	22.76	44
25.6	41.800	271	42.25	83	38.539	261	40.78	159	43.444	447	43.24	93	27.989	378	23.20	61
Nov. 4.6	42.071	251	41.42	96	38.800	241	42.37	187	43.891	414	44.17	117	28.367	352	23.81	77
14.6	42.322	228	40.46	106	39.041	215	44.24	211	44.305	372	45.34	136	28.719	317	24.58	91
24.6	42.550	199	39.40	110	39.256	184	46.35	223	44.677	320	46.70	155	29.036	277	25.49	105
Dec. 4.5	42.749	162	38.30	110	39.440	146	48.58	230	44.997	259	48.25	170	29.313	227	26.54	118
14.5	42.911	123	37.20	106	39.586	105	50.88	228	45.256	189	49.95	179	29.540	170	27.72	126
24.5	43.034	78	36.14	99	39.691	59	53.16	217	45.445	115	51.74	182	29.710	109	28.98	130
34.5	43.112		35.15		39.750		55.33		45.560		53.56		29.819		30.28	
Mean Place	37.435		32.49		34.729		56.06		36.694		47.15		22.062		24.64	
Sec δ, Tan δ	1.008		+0.130		1.031		−0.253		1.712		+1.391		1.413		+0.998	
$D_\phi \alpha$, $D_\omega \alpha$	+0.06		0.00		+0.05		0.00		+0.10		0.00		+0.09		0.00	
$D_\phi \delta$, $D_\omega \delta$	0.0		+1.0		0.0		+1.0		0.0		+1.0		0.0		+1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	θ Aurigæ. Mag. 2.7				1 Geminorum. Mag. 4.3				1 G. Puppis. Mag. 6.2				ν Orionis. Mag. 4.4			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	5 53		+37 12		5 59		+23 16		6 2		−45 1		6 2		+14 46	
	s		″		s		″		s		″		s		″	
Jan. 0.5	62.358		34.75		3.292		13.28		5.721		67.52		48.893		50.80	
		72		87		71		1		17		324		70		51
10.4	62.430		35.62		3.363		13.29		5.704		70.76		48.963		50.29	
		12		86		19		7		79		298		20		41
20.4	62.442	—	36.48		3.382	—	13.36		5.625		73.74		48.983	—	49.88	
		45		81		31		10		135		266		28		33
30.4	62.397		37.29		3.351		13.46		5.490		76.40		48.955		49.55	
		97		70		78		12		187		226		72		25
Feb. 9.4	62.300		37.99		3.273		13.58		5.303		78.66		48.883		49.30	
		142		58		117		11		230		181		111		19
19.3	62.158		38.57		3.156		13.69		5.073		80.47		48.772		49.11	
		178		40		148		7		265		134		141		14
29.3	61.980		38.97		3.008		13.76		4.808		81.81		48.631		48.97	
		201		20		171		2		286		84		163		11
Mar. 10.3	61.779		39.17	—	2.837		13.78	—	4.522		82.65		48.468		48.86	
		211		1		181		4		296		34		172		8
20.3	61.568		39.16		2.656		13.74		4.226		82.99	—	48.296		48.78	
		208		22		179		10		296		16		171		5
30.2	61.360		38.94		2.477		13.64		3.930		82.83		48.125		48.73	
		194		42		166		16		283		66		160		3
Apr. 9.2	61.166		38.52		2.311		13.48		3.647		82.17		47.965		48.70	—
		165		59		145		21		259		112		139		2
19.2	61.001		37.93		2.166		13.27		3.388		81.05		47.826		48.72	
		129		74		112		25		226		156		110		6
29.1	60.872		37.19		2.054		13.02		3.162		79.49		47.716		48.78	
		86		85		75		24		188		196		75		10
May 9.1	60.786		36.34		1.979		12.78		2.974		77.53		47.641		48.88	
		36		92		33		23		139		231		35		17
19.1	60.750	—	35.42		1.946	—	12.55		2.835		75.22		47.606	—	49.05	
		15		95		11		21		89		262		7		25
29.1	60.765		34.47		1.957		12.34		2.746		72.60		47.613		49.30	
		67		94		57		17		37		284		48		31
June 8.0	60.832		33.53		2.014		12.17		2.709	—	69.76		47.661		49.61	
		118		91		101		11		18		302		92		38
18.0	60.950		32.62		2.115		12.06		2.727		66.74		47.753		49.99	
		167		85		142		5		71		309		131		44
28.0	61.117		31.77		2.257		12.01		2.798		63.65		47.884		50.43	
		210		77		181		0		122		310		167		49
July 8.0	61.327		31.00		2.438		12.01		2.920		60.55		48.051		50.92	
		249		67		216		5		171		299		200		51
17.9	61.576		30.33		2.654		12.06		3.091		57.56		48.251		51.43	
		282		57		243		9		217		283		227		51
27.9	61.858		29.76		2.897		12.15		3.308		54.73		48.478		51.94	
		311		47		269		12		256		255		252		48
Aug. 6.9	62.169		29.29		3.166		12.27		3.564		52.18		48.730		52.42	
		333		37		288		12		289		218		270		43
16.8	62.502		28.92		3.454		12.39		3.853		50.00		49.000		52.85	
		351		28		305		9		319		174		286		34
26.8	62.853		28.64		3.759		12.48		4.172		48.26		49.286		53.19	
		362		18		316		6		341		124		296		21
Sept. 5.8	63.215		28.46		4.075		12.54		4.513		47.02		49.582		53.40	
		371		11		322		1		356		67		306		9
15.8	63.586		28.35		4.397		12.55	—	4.869		46.35		49.888		53.49	—
		373		2		327		5		363		7		308		6
25.7	63.959		28.33	—	4.724		12.50		5.232		46.28	—	50.196		53.43	
		373		5		326		12		363		55		310		22
Oct. 5.7	64.332		28.38		5.050		12.38		5.595		46.83		50.506		53.21	
		368		13		321		18		353		116		305		36
15.7	64.700		28.51		5.371		12.20		5.948		47.99		50.811		52.85	
		356		22		314		25		339		174		300		49
25.7	65.056		28.73		5.685		11.95		6.287		49.73		51.111		52.36	
		341		31		300		26		313		226		287		60
Nov. 4.6	65.397		29.04		5.985		11.69		6.600		51.99		51.398		51.76	
		319		41		283		27		281		271		270		68
14.6	65.716		29.45		6.268		11.42		6.881		54.70		51.668		51.08	
		289		51		258		26		240		307		247		73
24.6	66.005		29.96		6.526		11.16		7.121		57.77		51.915		50.35	
		252		61		226		22		193		331		217		74
Dec. 4.5	66.257		30.57		6.752		10.94		7.314		61.08		52.132		49.61	
		209		72		190		17		138		344		183		69
14.5	66.466		31.29		6.942		10.77		7.452		64.52		52.315		48.92	
		158		79		147		11		80		346		142		65
24.5	66.624		32.08		7.089		10.66		7.532		67.98		52.457		48.27	
		104		84		96		4		20		337		95		58
34.5	66.728		32.92		7.185		10.62		7.552		71.35		52.552		47.69	
Mean Place	59.593		28.13		0.858		7.86		3.356		69.85		46.584		46.06	
Sec δ, Tan δ	1.256		+0.759		1.089		+0.430		1.415		−1.001		1.034		+0.264	
Dψ α, Dω α	+0.08		0.00		+0.07		0.00		+0.03		0.00		+0.07		0.00	
Dψ δ, Dω δ	0.0		+1.0		0.0		+1.0		0.0		+1.0		0.0		+1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	22 H. Camelop. Mag. 4.7				η Geminorum. Var. 3.2–4.2				2 Lyncis. Mag. 4.4				ζ Canis Majoris. Mag. 3.1			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	6 9		+69 20		6 9		+22 31		6 12		+59 2		6 17		−30 1	
	s		″		s		″		s		″		s		″	
Jan. 0.5	41.24		71.19		50.915		60.55		16.981		40.66		7.394		29.49	
10.5	41.35	$\underline{11}$	73.73	254	50.996	81	60.50	$\underline{5}$	17.085	104	42.73	207	7.429	$\underline{35}$	32.37	288
20.4	41.33	2	76.21	248	51.025	$\underline{29}$	60.53	3	17.099	$\underline{14}$	44.76	203	7.412	17	35.03	266
30.4	41.18	15	78.52	231	51.004	21	60.60	7	17.026	73	46.66	190	7.344	68	37.43	240
Feb. 9.4	40.90	28	80.54	202	50.935	69	60.71	11	16.871	155	48.36	170	7.230	114	39.48	205
19.3	40.54	36	82.23	169	50.824	111	60.82	11	16.645	226	49.78	142	7.075	155	41.16	168
29.3	40.10	44	83.49	126	50.681	143	60.91	9	16.361	284	50.86	108	6.888	187	42.45	129
Mar. 10.3	39.60	50	84.29	80	50.514	167	60.96	5	16.037	324	51.55	69	6.678	210	43.32	87
20.3	39.07	53	84.60	$\underline{31}$	50.335	179	60.96	0	15.692	345	51.84	$\underline{29}$	6.457	221	43.77	45
30.2	38.54	53	84.39	21	50.156	179	60.91	5	15.346	346	51.70	14	6.233	224	43.79	$\underline{2}$
Apr. 9.2	38.04	50	83.70	69	49.988	168	60.80	11	15.015	331	51.15	55	6.020	213	43.39	40
19.2	37.58	46	82.56	114	49.839	149	60.64	16	14.719	296	50.23	92	5.823	197	42.58	81
29.2	37.19	39	81.00	156	49.721	118	60.46	18	14.471	248	48.96	127	5.654	169	41.40	118
May 9.1	36.89	30	79.11	189	49.639	82	60.26	20	14.285	186	47.40	156	5.518	136	39.86	154
19.1	36.70	19	76.92	219	49.598	$\underline{41}$	60.07	19	14.167	118	45.62	178	5.419	99	38.02	184
29.1	36.60	$\underline{10}$	74.55	237	49.599	1	59.89	18	14.126	$\underline{41}$	43.67	195	5.363	56	35.89	213
June 8.0	36.62	2	72.05	250	49.645	46	59.76	13	14.162	36	41.61	206	5.350	$\underline{13}$	33.54	235
18.0	36.75	13	69.50	255	49.735	90	59.68	8	14.273	111	39.52	209	5.382	32	31.03	251
28.0	37.00	25	66.96	254	49.866	131	59.64	$\underline{4}$	14.460	187	37.44	208	5.458	76	28.41	262
July 8.0	37.34	34	64.51	245	50.036	170	59.65	1	14.718	258	35.43	201	5.575	117	25.77	264
17.9	37.77	43	62.20	231	50.240	204	59.69	4	15.038	320	33.54	189	5.731	156	23.19	258
27.9	38.29	52	60.09	211	50.473	233	59.77	8	15.416	378	31.81	173	5.921	190	20.75	244
Aug. 6.9	38.88	59	58.19	190	50.733	260	59.85	8	15.842	426	30.27	154	6.145	224	18.52	223
16.9	39.53	65	56.59	160	51.012	279	59.93	8	16.308	466	28.93	134	6.394	249	16.57	195
26.8	40.25	72	55.27	132	51.308	296	59.97	4	16.809	501	27.84	109	6.667	273	15.00	157
Sept. 5.8	40.99	74	54.27	100	51.618	310	59.97	0	17.336	527	26.99	85	6.958	291	13.86	114
15.8	41.77	78	53.62	65	51.936	318	59.91	6	17.881	545	26.41	58	7.264	306	13.21	65
25.7	42.56	79	53.32	$\underline{30}$	52.259	323	59.77	14	18.437	556	26.11	30	7.577	313	13.08	$\underline{13}$
Oct. 5.7	43.35	79	53.39	7	52.584	325	59.56	21	18.996	559	26.08	$\underline{3}$	7.893	316	13.50	42
15.7	44.13	78	53.81	42	52.907	323	59.28	28	19.550	554	26.35	27	8.206	313	14.46	96
25.7	44.89	76	54.62	81	53.224	317	58.95	33	20.090	540	26.90	55	8.511	305	15.93	147
Nov. 4.6	45.61	72	55.78	116	53.530	306	58.58	37	20.609	519	27.75	85	8.801	290	17.87	194
14.6	46.28	67	57.28	150	53.818	288	58.20	38	21.093	484	28.88	113	9.069	268	20.20	233
24.6	46.88	60	59.10	182	54.083	265	57.84	36	21.531	438	30.26	138	9.309	240	22.89	269
Dec. 4.6	47.39	51	61.20	210	54.320	237	57.52	32	21.914	383	31.89	163	9.514	205	25.78	289
14.5	47.81	42	63.51	231	54.519	199	57.26	26	22.230	316	33.71	182	9.677	163	28.80	302
24.5	48.11	30	65.97	246	54.675	156	57.08	18	22.469	239	35.67	196	9.792	115	31.85	305
34.5	48.28	17	68.51	254	54.784	109	56.97	11	22.624	155	37.71	204	9.859	67	34.82	297
Mean Place	35.607		64.42		48.476		55.79		12.906		34.56		5.227		32.51	
Sec δ, Tan δ	2.836		+2.654		1.082		+0.415		1.944		+1.667		1.155		−0.578	
$D_\psi\alpha$, $D_\omega\alpha$	+0.13		+0.01		+0.07		0.00		+0.11		+0.01		+0.05		0.00	
$D_\psi\delta$, $D_\omega\delta$	0.0		+1.0		0.0		+1.0		0.0		+1.0		0.0		+1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	μ Geminorum. Mag. 3.2				ψ^1 Aurigæ. Mag. 5.1				β Canis Majoris. Mag. 2.0				8 Monocerotis. Mag. 4.5			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	6 17		+22 33		6 18		+49 19		6 19		−17 54		6 19		+ 4 38	
	s		″		s		″		s		″		s		″	
Jan. 0.5	55.203		32.26		29.262		60.79		2.136		44.80		21.259		14.91	
		90		6		109		155		55		238		77		116
10.5	55.293		32.20	—	29.371		62.34		2.191		47.18		21.336		13.75	
		38		1		35		155		6		218		30		103
20.4	55.331	—	32.21		29.406	—	63.89		2.197	—	49.36		21.366	—	12.72	
		15		8		35		148		42		195		18		89
30.4	55.316		32.29		29.371		65.37		2.155		51.31		21.348		11.83	
		62		11		103		135		87		167		63		72
Feb. 9.4	55.254		32.40		29.268		66.72		2.068		52.98		21.285		11.11	
		105		13		162		115		125		136		100		57
19.3	55.149		32.53		29.106		67.87		1.943		54.34		21.185		10.54	
		139		12		210		90		156		103		134		43
29.3	55.010		32.65		28.896		68.77		1.787		55.37		21.051		10.11	
		164		8		242		59		178		70		155		27
Mar. 10.3	54.846		32.73		28.654		69.36		1.609		56.07		20.896		9.84	
		178		3		264		28		190		35		169		14
20.3	54.668		32.76	—	28.390		69.64	—	1.419		56.42		20.727		9.70	
		179		3		265		4		192		3		170		2
30.2	54.489		32.73		28.125		69.60		1.227		56.45	—	20.557		9.68	—
		170		8		252		39		184		31		161		11
Apr. 9.2	54.319		32.65		27.873		69.21		1.043		56.14		20.396		9.79	
		151		13		226		69		166		63		144		25
19.2	54.168		32.52		27.647		68.52		0.877		55.51		20.252		10.04	
		122		16		189		95		142		93		118		36
29.2	54.046		32.36		27.458		67.57		0.735		54.58		20.134		10.40	
		87		19		140		119		110		122		87		49
May 9.1	53.959		32.17		27.318		66.38		0.625		53.36		20.047		10.89	
		49		19		85		136		73		147		51		61
19.1	53.910		31.98		27.233		65.02		0.552		51.89		19.996		11.50	
		5		17		26		150		34		171		11		73
29.1	53.905	—	31.81		27.207	—	63.52		0.518	—	50.18		19.985	—	12.23	
		39		15		35		158		6		189		29		83
June 8.0	53.944		31.66		27.242		61.94		0.524		48.29		20.014		13.06	
		83		11		98		161		46		203		68		91
18.0	54.027		31.55		27.340		60.33		0.570		46.26		20.082		13.97	
		123		6		155		161		87		213		107		98
28.0	54.150		31.49		27.495		58.72		0.657		44.13		20.189		14.95	
		162		3		210		154		125		215		141		100
July 8.0	54.312		31.46		27.705		57.18		0.782		41.98		20.330		15.95	
		197		0		259		146		159		210		175		100
17.9	54.509		31.46		27.964		55.72		0.941		39.88		20.505		16.95	
		226		3		304		135		190		201		203		96
27.9	54.735		31.49		28.268		54.37		1.131		37.87		20.708		17.91	
		254		3		343		122		218		184		228		88
Aug. 6.9	54.989		31.52		28.611		53.15		1.349		36.03		20.936		18.79	
		274		2		374		105		241		158		248		75
16.9	55.263		31.54	—	28.985		52.10		1.590		34.45		21.184		19.54	
		292		2		402		90		261		128		265		60
26.8	55.555		31.52		29.387		51.20		1.851		33.17		21.449		20.14	
		307		6		421		72		276		93		279		40
Sept. 5.8	55.862		31.46		29.808		50.48		2.127		32.24		21.728		20.54	
		316		12		437		55		288		51		288		16
15.8	56.178		31.34		30.245		49.93		2.415		31.73		22.016		20.70	—
		323		20		447		36		296		7		296		8
25.7	56.501		31.14		30.692		49.57		2.711		31.66	—	22.312		20.62	
		325		28		451		16		299		39		298		35
Oct. 5.7	56.826		30.86		31.143		49.41	—	3.010		32.05		22.610		20.27	
		325		34		450		4		297		85		298		58
15.7	57.151		30.52		31.593		49.45		3.307		32.90		22.908		19.69	
		321		39		440		26		291		128		293		83
25.7	57.472		30.13		32.033		49.71		3.598		34.18		23.201		18.86	
		309		43		425		46		280		166		284		103
Nov. 4.6	57.781		29.70		32.458		50.17		3.878		35.84		23.485		17.83	
		295		44		402		69		261		201		269		119
14.6	58.076		29.26		32.860		50.86		4.139		37.85		23.754		16.64	
		273		41		368		89		238		226		247		130
24.6	58.349		28.85		33.228		51.75		4.377		40.11		24.001		15.34	
		243		37		326		109		206		244		220		136
Dec. 4.6	58.592		28.48		33.554		52.84		4.583		42.55		24.221		13.98	
		207		31		276		128		170		253		188		137
14.5	58.799		28.17		33.830		54.12		4.753		45.08		24.409		12.61	
		166		21		215		141		129		254		147		132
24.5	58.965		27.96		34.045		55.53		4.882		47.62		24.556		11.29	
		117		13		148		150		82		247		103		125
34.5	59.082		27.83		34.193		57.03		4.964		50.09		24.659		10.04	
Mean Place	52.755		27.98		25.912		55.64		0.013		48.02		19.045		11.22	
Sec δ, Tan δ	1.083		+0.415		1.534		+1.164		1.051		−0.323		1.003		+0.081	
$D_\psi \alpha$, $D_\epsilon \alpha$	+0.07		0.00		+0.09		+0.01		+0.05		0.00		+0.06		0.00	
$D_\psi \delta$, $D_\epsilon \delta$	0.0		+1.0		0.0		+1.0		0.0		+1.0		0.0		+1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

ashington lean Time.	**α Argus.** (*Canopus.*) Mag. −0.9				**10 Monocerotis.** Mag. 5.0				**ν Geminorum.** Mag. 4.1				**8 Lyncis.** Mag. 6.0			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	6 22		−52 38		6 23		− 4 42		6 23		+20 15		6 30		+61 33	
	s		″		s		″		s		″		s		″	
Jan. 0.5	7.784		55.00		50.906		30.09		60.955		62.73		5.53		28.11	
		14		350		73		170		92		21		14		217
10.5	7.770		58.50		50.979		31.79		61.047		62.52		5.67		30.28	
		87		328		26		155		43		13		5		216
20.4	7.683		61.78		51.005	—	33.34		61.090	—	62.39		5.72	—	32.44	
		155		298		22		138		8		5		6		207
30.4	7.528		64.76		50.983		34.72		61.082		62.34	—	5.66		34.51	
		215		259		65		115		57		1		14		190
Feb. 9.4	7.313		67.35		50.918		35.87		61.025		62.35		5.52		36.41	
		268		215		105		94		98		5		24		163
19.4	7.045		69.50		50.813		36.81		60.927		62.40		5.28		38.04	
		310		167		136		70		134		6		29		130
29.3	6.735		71.17		50.677		37.51		60.793		62.46		4.99		39.34	
		339		116		159		48		160		6		34		93
Mar. 10.3	6.396		72.33		50.518		37.99		60.633		62.52		4.65		40.27	
		356		64		171		24		173		3		37		49
20.3	6.040		72.97		50.347		38.23		60.460		62.55		4.28		40.76	
		359		11		175		4		177		1		38		6
30.2	5.681		73.08	—	50.172		38.27	—	60.283		62.56	—	3.90		40.82	—
		348		40		166		20		168		4		37		39
Apr. 9.2	5.333		72.68		50.006		38.07		60.115		62.52		3.53		40.43	
		328		91		150		39		151		5		34		80
19.2	5.005		71.77		49.856		37.68		59.964		62.47		3.19		39.63	
		295		137		126		60		124		8		30		118
29.2	4.710		70.40		49.730		37.08		59.840		62.39		2.89		38.45	
		254		183		96		80		92		8		23		151
May 9.1	4.456		68.57		49.634		36.28		59.748		62.31		2.66		36.94	
		206		222		60		98		52		8		15		178
19.1	4.250		66.35		49.574		35.30		59.696		62.23		2.51		35.16	
		151		256		22		115		10		5		9		199
29.1	4.099		63.79		49.552	—	34.15		59.686	—	62.18		2.42		33.17	
		93		282		18		128		32		3		0		215
June 8.1	4.006		60.97		49.570		32.87		59.718		62.15	—	2.42		31.02	
		32		305		58		138		75		1		8		223
18.0	3.974	—	57.92		49.628		31.49		59.793		62.16		2.50		28.79	
		28		316		94		147		115		6		16		224
28.0	4.002		54.76		49.722		30.02		59.908		62.22		2.66		26.55	
		89		319		130		150		154		8		24		221
July 8.0	4.091		51.57		49.852		28.52		60.062		62.30		2.90		24.34	
		147		314		163		148		187		10		30		212
17.9	4.238		48.43		50.015		27.04		60.249		62.40		3.20		22.22	
		203		299		192		141		218		12		37		200
27.9	4.441		45.44		50.207		25.63		60.467		62.52		3.57		20.22	
		253		275		218		130		243		11		43		183
Aug. 6.9	4.694		42.69		50.425		24.33		60.710		62.63		4.00		18.39	
		298		239		239		110		266		8		47		162
16.9	4.992		40.30		50.664		23.23		60.976		62.71		4.47		16.77	
		337		197		258		90		284		3		52		140
26.8	5.329		38.33		50.922		22.33		61.260		62.74	—	4.99		15.37	
		368		146		271		62		298		4		54		115
Sept. 5.8	5.697		36.87		51.193		21.71		61.558		62.70		5.53		14.22	
		392		88		283		31		310		12		58		89
15.8	6.089		35.99		51.476		21.40	—	61.868		62.58		6.11		13.33	
		407		28		290		2		317		24		58		58
25.8	6.496		35.71	—	51.766		21.42		62.185		62.34		6.69		12.75	
		412		36		295		37		320		31		60		29
ct. 5.7	6.908		36.07		52.061		21.79		62.505		62.03		7.29		12.46	—
		408		102		294		71		321		41		60		2
15.7	7.316		37.09		52.355		22.50		62.826		61.62		7.89		12.48	
		392		162		290		103		317		49		59		34
25.7	7.708		38.71		52.645		23.53		63.143		61.13		8.48		12.82	
		367		220		280		132		307		54		57		67
ov. 4.6	8.075		40.91		52.925		24.85		63.450		60.59		9.05		13.49	
		332		270		265		155		294		57		54		97
14.6	8.407		43.61		53.190		26.40		63.744		60.02		9.59		14.46	
		286		311		245		174		272		57		50		130
24.6	8.693		46.72		53.435		28.14		64.016		59.45		10.09		15.76	
		229		340		217		185		244		53		44		157
ec. 4.6	8.922		50.12		53.652		29.99		64.260		58.92		10.53		17.33	
		169		360		184		189		209		46		36		180
14.5	9.091		53.72		53.836		31.88		64.469		58.46		10.89		19.13	
		99		366		143		188		169		39		29		200
24.5	9.190		57.38		53.979		33.76		64.638		58.07		11.18		21.13	
		29		360		100		180		121		28		19		213
34.5	9.219		60.98		54.079		35.56		64.759		57.79		11.37		23.26	
n Place	5.233		58.12		48.754		33.46		58.542		58.87		1.113		23.74	
δ, Tan δ	1.648		−1.310		1.003		−0.082		1.066		+0.369		2.100		+1.846	
, $D_\omega \alpha$	+0.03		−0.01		+0.06		0.00		+0.07		0.00		+0.11		+0.02	
, $D_\omega \delta$	0.0		+1.0		0.0		+1.0		0.0		+1.0		−0.1		+1.0	

Washington Mean Time.	ξ^2 Canis Majoris. Mag. 4.5				23 H. Camelop. Mag. 5.6				51 Aurigæ. Mag. 5.7				γ Geminorum. Mag. 1.9			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	6 31		−22 53		6 31		+79 39		6 32		+39 27		6 32		+16 28	
	s		″		s		″		s		″		s		″	
Jan. 0.5	34.299	61	45.88	265	65.89	21	33.94	292	53.291	119	61.40	94	53.955	100	22.30	48
10.5	34.360	11	48.53	247	66.10	— 2	36.86	288	53.410	56	62.34	101	54.055	50	21.82	36
20.4	34.371	— 39	51.00	222	66.08	28	39.74	274	53.466	— 5	63.35	101	54.105	— 2	21.46	26
30.4	34.332	85	53.22	193	65.80	50	42.48	247	53.461	65	64.36	96	54.103	48	21.20	18
Feb. 9.4	34.247	127	55.15	160	65.30	71	44.95	213	53.396	118	65.32	86	54.055	92	21.02	9
19.4	34.120	160	56.75	124	64.59	88	47.08	167	53.278	161	66.18	71	53.963	128	20.93	4
29.3	33.960	184	57.99	86	63.71	99	48.75	117	53.117	192	66.89	53	53.835	152	20.89	1
Mar. 10.3	33.776	197	58.85	51	62.72	107	49.92	63	52.925	214	67.42	30	53.683	169	20.88	— 1
20.3	33.579	202	59.36	12	61.65	110	50.55	5	52.711	218	67.72	8	53.514	173	20.89	2
30.2	33.377	197	59.48	— 26	60.55	108	50.60	— 51	52.493	210	67.80	— 17	53.341	166	20.91	2
Apr. 9.2	33.180	180	59.22	59	59.47	100	50.09	105	52.283	192	67.63	38	53.175	151	20.93	3
19.2	33.000	156	58.63	95	58.47	89	49.04	155	52.091	160	67.25	57	53.024	125	20.96	5
29.2	32.844	126	57.68	127	57.58	74	47.49	198	51.931	122	66.68	77	52.899	95	21.01	6
May 9.1	32.718	92	56.41	156	56.84	57	45.51	233	51.809	77	65.91	89	52.804	57	21.07	9
19.1	32.626	53	54.85	180	56.27	38	43.18	263	51.732	28	65.02	100	52.747	18	21.16	13
29.1	32.573	12	53.05	202	55.89	16	40.55	282	51.704	— 23	64.02	106	52.729	— 24	21.29	18
June 8.1	32.561	— 29	51.03	219	55.73	— 4	37.73	294	51.727	74	62.96	109	52.753	65	21.47	21
18.0	32.590	70	48.84	229	55.77	26	34.79	299	51.801	124	61.87	109	52.818	103	21.68	26
28.0	32.660	108	46.55	233	56.03	45	31.80	296	51.925	169	60.78	107	52.921	140	21.94	28
July 8.0	32.768	144	44.22	230	56.48	66	28.84	284	52.094	212	59.71	102	53.061	175	22.22	29
17.9	32.912	179	41.92	220	57.14	83	26.00	267	52.306	250	58.69	97	53.236	205	22.51	28
27.9	33.091	209	39.72	201	57.97	100	23.33	245	52.556	282	57.72	89	53.441	230	22.79	24
Aug. 6.9	33.300	233	37.71	177	58.97	114	20.88	216	52.838	312	56.83	81	53.671	254	23.03	20
16.9	33.533	257	35.94	145	60.11	125	18.72	186	53.150	334	56.02	72	53.925	272	23.23	11
26.8	33.790	275	34.49	105	61.36	135	16.86	149	53.484	354	55.30	65	54.197	287	23.34	1
Sept. 5.8	34.065	289	33.44	63	62.71	143	15.37	111	53.838	369	54.65	57	54.484	299	23.35	— 11
15.8	34.354	299	32.81	15	64.14	148	14.26	70	54.207	379	54.08	47	54.783	309	23.24	25
25.8	34.653	305	32.66	— 34	65.62	150	13.56	28	54.586	385	53.61	37	55.092	313	22.99	38
Oct. 5.7	34.958	305	33.00	84	67.12	150	13.28	— 17	54.971	388	53.24	26	55.405	315	22.61	52
15.7	35.263	300	33.84	131	68.62	147	13.45	61	55.359	384	52.98	14	55.720	313	22.09	63
25.7	35.563	291	35.15	175	70.09	140	14.06	105	55.743	374	52.84	1	56.033	304	21.46	72
Nov. 4.6	35.854	273	36.90	212	71.49	130	15.11	148	56.117	357	52.83	— 13	56.337	293	20.74	79
14.6	36.127	248	39.02	242	72.79	117	16.59	187	56.474	333	52.96	31	56.630	273	19.95	80
24.6	36.375	218	41.44	265	73.96	102	18.46	223	56.807	300	53.27	45	56.903	246	19.15	78
Dec. 4.6	36.593	180	44.09	276	74.98	83	20.69	253	57.107	258	53.72	62	57.149	213	18.37	73
14.5	36.773	138	46.85	280	75.81	59	23.22	275	57.365	209	54.34	77	57.362	172	17.64	66
24.5	36.911	91	49.65	274	76.40	36	25.97	287	57.574	153	55.11	88	57.534	128	16.98	55
34.5	37.002		52.39		76.76		28.84		57.727		55.99		57.662		16.43	
Mean Place	32.170		49.14		55.274		29.35		50.375		57.77		51.596		18.98	
Sec δ, Tan δ	1.085		−0.422		5.571		+5.481		1.295		+0.823		1.043		+0.296	
$D_\psi \alpha$, $D_\omega \alpha$	+0.05		0.00		+0.20		+0.05		+0.08		+0.01		+0.07		0.00	
$D_\psi \delta$, $D_\omega \delta$	−0.1		+1.0		−0.1		+1.0		−0.1		+1.0		−0.1		+1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ν Argus. Mag. 3.2				S Monocerotis. Mag. 4.7				ε Geminorum. Mag. 3.2				ξ Geminorum. Mag. 3.4			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 6 35		° ′ −43 6		h m 6 36		° ′ + 9 58		h m 6 38		° ′ +25 12		h m 6 40		° ′ +12 59	
	s		″		s		″		s		″		s		″	
Jan. 0.5	13.850		74.94		23.415		30.81		48.416		58.39		36.840		16.69	
		32		338		98		89		113		5		105		72
10.5	13.882		78.32		23.513		29.92		48.529		58.44		36.945		15.97	
		29		319		49		75		60		16		54		59
20.4	13.853		81.51		23.562		29.17		48.589		58.60		36.999		15.38	
		89		290		0		63		5		24		5		48
30.4	13.764		84.41		23.562		28.54		48.594		58.84		37.004		14.90	
		145		254		47		50		46		27		43		35
Feb. 9.4	13.619		86.95		23.515		28.04		48.548		59.11		36.961		14.55	
		193		215		89		38		92		29		86		24
19.4	13.426		89.10		23.426		27.66		48.456		59.40		36.875		14.31	
		230		170		125		25		131		27		123		16
29.3	13.196		90.80		23.301		27.41		48.325		59.67		36.752		14.15	
		260		123		148		16		159		22		149		9
Mar. 10.3	12.936		92.03		23.153		27.25		48.166		59.89		36.603		14.06	
		276		75		166		7		177		16		164		3
20.3	12.660		92.78		22.987		27.18		47.989		60.05		36.439		14.03	
		282		25		169		0		183		7		171		1
30.3	12.378		93.03		22.818		27.18		47.806		60.12		36.268		14.04	
		276		23		163		7		177		1		165		6
Apr. 9.2	12.102		92.80		22.655		27.25		47.629		60.11		36.103		14.10	
		259		71		150		14		160		9		151		10
19.2	11.843		92.09		22.505		27.39		47.469		60.02		35.952		14.20	
		234		117		125		23		137		17		127		14
29.2	11.609		90.92		22.380		27.62		47.332		59.85		35.825		14.34	
		199		158		95		29		103		24		99		18
May 9.1	11.410		89.34		22.285		27.91		47.229		59.61		35.726		14.52	
		159		197		60		36		65		27		62		25
19.1	11.251		87.37		22.225		28.27		47.164		59.34		35.664		14.77	
		114		229		22		44		23		29		25		29
29.1	11.137		85.08		22.203		28.71		47.141		59.05		35.639		15.06	
		66		259		18		51		20		30		16		34
June 8.1	11.071		82.49		22.221		29.22		47.161		58.75		35.655		15.40	
		16		278		57		57		63		29		55		39
18.0	11.055		79.71		22.278		29.79		47.224		58.46		35.710		15.79	
		34		293		95		62		105		28		93		43
28.0	11.089		76.78		22.373		30.41		47.329		58.18		35.803		16.22	
		84		298		131		65		144		26		130		45
July 8.0	11.173		73.89		22.504		31.06		47.473		57.92		35.933		16.67	
		132		295		165		65		180		22		163		46
18.0	11.305		70.85		22.669		31.71		47.653		57.70		36.096		17.13	
		177		284		193		62		212		23		193		43
27.9	11.482		68.01		22.862		32.33		47.865		57.47		36.289		17.56	
		218		261		221		56		240		22		220		39
Aug. 6.9	11.700		65.40		23.083		32.89		48.105		57.25		36.509		17.95	
		254		232		241		47		265		24		242		31
16.9	11.954		63.08		23.324		33.36		48.370		57.01		36.751		18.26	
		288		192		262		34		284		25		263		19
26.8	12.242		61.16		23.586		33.70		48.654		56.76		37.014		18.45	
		315		145		276		18		303		29		277		8
Sept. 5.8	12.557		59.71		23.862		33.88		48.957		56.47		37.291		18.53	
		335		92		288		1		315		34		290		9
15.8	12.892		58.79		24.150		33.89		49.272		56.13		37.581		18.44	
		351		34		298		21		325		38		301		25
25.8	13.243		58.45		24.448		33.68		49.597		55.75		37.882		18.19	
		358		26		305		39		332		43		308		42
Oct. 5.7	13.601		58.71		24.753		33.29		49.929		55.32		38.190		17.77	
		358		88		305		59		335		47		310		60
15.7	13.959		59.59		25.058		32.70		50.264		54.85		38.500		17.17	
		349		148		303		79		334		49		309		75
25.7	14.308		61.07		25.361		31.91		50.598		54.36		38.809		16.42	
		334		203		297		93		326		50		302		87
Nov. 4.7	14.642		63.10		25.658		30.98		50.924		53.86		39.111		15.55	
		309		250		285		104		314		47		292		96
14.6	14.951		65.60		25.943		29.94		51.238		53.39		39.403		14.59	
		274		293		265		112		293		42		273		101
24.6	15.225		68.53		26.208		28.82		51.531		52.97		39.676		13.58	
		233		321		241		115		266		35		247		101
Dec. 4.6	15.458		71.74		26.449		27.67		51.797		52.62		39.923		12.57	
		184		340		208		112		233		24		215		98
14.5	15.642		75.14		26.657		26.55		52.030		52.38		40.138		11.59	
		128		350		169		107		189		14		176		91
24.5	15.770		78.64		26.826		25.48		52.219		52.24		40.314		10.68	
		69		346		125		97		142		3		131		80
34.5	15.839		82.10		26.951		24.51		52.361		52.21		40.445		9.88	
Mean Place	11.546		78.49		21.140		27.69		45.897		55.35		34.528		13.76	
Sec δ, Tan δ	1.370		−0.936		1.015		+0.176		1.105		+0.471		1.026		+0.231	
$D_\psi \alpha$, $D_\omega \alpha$	+0.04		−0.01		+0.07		0.00		+0.07		+0.01		+0.07		0.00	
$D_\psi \delta$, $D_\omega \delta$	−0.1		+1.0		−0.1		+1.0		−0.1		+1.0		−0.1		+1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ψ^5 **Aurigæ.** Mag. 5.3				α **Canis Majoris.** (*Sirius.*) Mag. −1.6				**18 Monocerotis.** Mag. 4.7				**43 Camelop.** Mag. 5.1			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		°	
	6 40		+43 39		6 41		−16 35		6 43		+ 2 30		6 44		+68 5	
	s		″		s		″		s		″		s		″	
Jan. 0.5	44.384	133	47.09	120	28.765	73	58.06	243	31.036	99	20.89	136	45.05	20	19.03	24
10.5	44.517	67	48.29	124	28.838	24	60.49	225	31.135	50	19.53	122	45.25	7	21.52	25
20.4	44.584	0	49.53	125	28.862	— 25	62.74	202	31.185	2	18.31	105	45.32	— 6	24.03	24
30.4	44.584	62	50.78	119	28.837	71	64.76	174	31.187	— 45	17.26	88	45.26	19	26.46	22
Feb. 9.4	44.522	120	51.97	108	28.766	111	66.50	146	31.142	87	16.38	69	45.07	29	28.72	19
19.4	44.402	168	53.05	90	28.655	146	67.96	113	31.055	121	15.69	53	44.78	38	30.70	16
29.3	44.234	204	53.95	68	28.509	171	69.09	81	30.934	147	15.16	35	44.40	45	32.32	120
Mar. 10.3	44.030	226	54.63	44	28.338	184	69.90	48	30.787	164	14.81	19	43.95	50	33.52	74
20.3	43.804	234	55.07	15	28.154	190	70.38	15	30.623	169	14.62	4	43.45	52	34.26	24
30.3	43.570	229	55.22	— 12	27.964	184	70.53	— 17	30.454	164	14.58	— 10	42.93	51	34.50	— 25
Apr. 9.2	43.341	209	55.10	38	27.780	169	70.36	46	30.290	152	14.68	26	42.42	48	34.25	73
19.2	43.132	180	54.72	62	27.611	148	69.90	78	30.138	129	14.94	38	41.94	43	33.52	118
29.2	42.952	140	54.10	85	27.463	118	69.12	104	30.009	101	15.32	52	41.51	36	32.34	159
May 9.1	42.812	93	53.25	102	27.345	84	68.08	131	29.908	67	15.84	66	41.15	27	30.75	191
19.1	42.719	44	52.23	117	27.261	47	66.77	152	29.841	30	16.50	77	40.88	16	28.84	220
29.1	42.675	— 13	51.06	126	27.214	7	65.25	171	29.811	— 7	17.27	87	40.72	7	26.64	239
June 8.1	42.688	65	49.80	132	27.207	— 32	63.54	185	29.818	45	18.14	95	40.65	— 3	24.25	252
18.0	42.753	117	48.48	134	27.239	70	61.69	195	29.863	83	19.09	101	40.68	15	21.73	259
28.0	42.870	168	47.14	132	27.309	108	59.74	199	29.946	119	20.10	105	40.83	24	19.14	258
July 8.0	43.038	213	45.82	129	27.417	142	57.75	196	30.065	151	21.15	104	41.07	35	16.56	252
18.0	43.251	255	44.53	122	27.559	175	55.79	188	30.216	180	22.19	100	41.42	43	14.04	240
27.9	43.506	291	43.31	113	27.734	203	53.91	171	30.396	208	23.19	90	41.85	51	11.64	224
Aug. 6.9	43.797	321	42.18	106	27.937	226	52.20	149	30.604	229	24.09	77	42.36	58	9.40	203
16.9	44.118	348	41.12	95	28.163	248	50.71	120	30.833	249	24.86	60	42.94	64	7.37	175
26.8	44.466	370	40.17	83	28.411	267	49.51	86	31.082	267	25.46	39	43.58	69	5.62	1
Sept. 5.8	44.836	388	39.34	71	28.678	281	48.65	47	31.349	279	25.85	14	44.27	73	4.13	1
15.8	45.224	401	38.63	59	28.959	290	48.18	4	31.628	290	25.99	— 13	45.00	76	2.94	
25.8	45.625	409	38.04	46	29.249	297	48.14	— 41	31.918	296	25.86	40	45.76	78	2.10	
Oct. 5.7	46.034	411	37.58	29	29.546	299	48.55	85	32.214	300	25.46	69	46.54	78	1.61	
15.7	46.445	409	37.29	14	29.845	296	49.40	129	32.514	298	24.77	92	47.32	77	1.50	
25.7	46.854	400	37.15	— 3	30.141	287	50.69	166	32.812	293	23.85	117	48.09	75	1.76	
Nov. 4.7	47.254	383	37.18	23	30.428	272	52.35	201	33.105	282	22.68	134	48.84	72	2.41	
14.6	47.637	358	37.41	42	30.700	250	54.36	227	33.387	263	21.34	148	49.56	65	3.44	
24.6	47.995	324	37.83	63	30.950	222	56.63	245	33.650	239	19.86	155	50.21	57	4.83	
Dec. 4.6	48.319	280	38.46	80	31.172	188	59.08	256	33.889	206	18.31	157	50.78	50	6.56	
14.5	48.599	228	39.26	98	31.360	147	61.64	258	34.095	169	16.74	153	51.28	38	8.59	
24.5	48.827	169	40.24	111	31.507	101	64.22	251	34.264	124	15.21	145	51.66	27	10.85	
34.5	48.996		41.35		31.608		66.73		34.388		13.76		51.93		13.28	
Mean Place	41.291		44.08		26.790		60.58		28.835		18.00		39.362		16.09	
Sec δ, Tan δ	1.382		+0.954		1.044		−0.298		1.001		+0.044		2.789		+2.603	
$D_\psi \alpha$, $D_\omega \alpha$	+0.09		+0.01		+0.05		0.00		+0.06		0.00		+0.13		+0.03	
$D_\psi \delta$, $D_\omega \delta$	−0.1		+1.0		−0.1		+1.0		−0.1		+1.0		−0.1		+1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	θ Geminorum. Mag. 3.6				α Pictoris. Mag. 3.3				τ Argus. Mag. 2.8				15 Lyncis. Mag. 4.5			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	6 47		+34 3		6 47		−61 50		6 47		−50 30		6 50		+58 31	
	s		″		s		″		s		″		s		″	
Jan. 0.5	18.032		51.60		22.77		59.51		53.539		47.87		4.714		65.86	
10.5	18.164	132	52.19	59	22.77	0	63.23	372	53.571	32 —	51.47	360	4.886	172	67.84	198
20.5	18.236	72	52.87	68	22.66	11	66.78	355	53.532	39	54.88	341	4.968	82 —	69.87	203
30.4	18.249	13 —	53.61	74	22.47	19	70.08	330	53.427	105	58.04	316	4.959	9	71.88	201
Feb. 9.4	18.206	43	54.35	74	22.20	27	73.02	294	53.259	168	60.87	283	4.863	96	73.76	188
19.4	18.111	95	55.04	69	21.86	34	75.56	254	53.036	223	63.28	241	4.688	175	75.45	169
29.3	17.972	139	55.66	62	21.47	39	77.63	207	52.767	269	65.24	196	4.446	242	76.86	141
Mar. 10.3	17.801	171	56.15	49	21.03	44	79.20	157	52.464	303	66.72	148	4.154	292	77.94	108
20.3	17.609	192	56.49	34	20.56	47	80.25	105	52.140	324	67.69	97	3.829	325	78.63	69
30.3	17.409	200	56.65	16 —	20.08	48	80.76	51 —	51.807	333	68.15	46 —	3.490	339	78.91	28 —
Apr. 9.2	17.212	197	56.64	1	19.61	47	80.73	3	51.476	331	68.09	6	3.153	337	78.78	13
19.2	17.032	180	56.44	20	19.15	46	80.19	54	51.162	314	67.53	56	2.840	313	78.25	53
29.2	16.877	155	56.09	35	18.72	43	79.12	107	50.871	291	66.48	105	2.562	278	77.34	91
May 9.2	16.757	120	55.59	50	18.34	38	77.58	154	50.616	255	64.98	150	2.335	227	76.09	125
19.1	16.677	80	54.98	61	18.01	33	75.61	197	50.403	213	63.07	191	2.168	167	74.55	154
29.1	16.641	36 —	54.27	71	17.74	27	73.24	237	50.238	165	60.78	229	2.070	98	72.78	177
June 8.1	16.651	10	53.51	76	17.54	20	70.54	270	50.126	112	58.18	260	2.042	28 —	70.83	195
18.0	16.708	57	52.71	80	17.42	12	67.57	297	50.068	58 —	55.34	284	2.088	46	68.77	206
28.0	16.810	102	51.90	81	17.37	5 —	64.44	313	50.069	1	52.32	302	2.205	117	66.63	214
July 8.0	16.956	146	51.09	81	17.40	3	61.20	324	50.124	55	49.24	308	2.392	187	64.49	214
18.0	17.140	184	50.31	78	17.50	10	57.97	323	50.235	111	46.14	310	2.643	251	62.41	208
27.9	17.361	221	49.55	76	17.67	17	54.82	315	50.400	165	43.16	298	2.954	311	60.39	202
Aug. 6.9	17.613	252	48.82	73	17.92	25	51.89	293	50.616	216	40.36	280	3.319	365	58.50	189
16.9	17.893	280	48.14	68	18.24	32	49.25	264	50.877	261	37.87	249	3.731	412	56.76	174
26.9	18.197	304	47.48	66	18.61	37	47.00	225	51.179	302	35.76	211	4.184	453	55.22	154
Sept. 5.8	18.519	322	46.85	63	19.04	43	45.24	176	51.516	337	34.11	165	4.670	486	53.87	135
15.8	18.858	339	46.25	60	19.50	46	44.02	122	51.881	365	33.00	111	5.185	515	52.77	110
25.8	19.210	352	45.68	57	20.00	50	43.42	60 —	52.267	386	32.48	52 —	5.720	535	51.91	86
Oct. 5.7	19.570	360	45.16	52	20.50	50	43.47	5	52.665	398	32.60	12	6.267	547	51.33	58
15.7	19.934	364	44.68	48	21.01	51	44.18	71	53.064	399	33.35	75	6.821	554	51.03	30
25.7	20.298	364	44.28	40	21.51	50	45.55	137	53.458	394	34.74	139	7.372	551	51.03	0
Nov. 4.7	20.656	358	43.96	32	21.99	48	47.54	199	53.835	377	36.71	197	7.910	538	51.34	31
14.6	21.001	345	43.77	19	22.42	43	50.07	253	54.183	348	39.21	250	8.426	516	51.97	63
24.6	21.326	325	43.69	8 —	22.78	36	53.08	301	54.494	311	42.17	296	8.907	481	52.91	94
Dec. 4.6	21.621	295	43.76	7	23.09	31	56.44	336	54.756	262	45.46	329	9.341	434	54.15	124
14.6	21.880	259	43.97	21	23.31	22	60.07	363	54.962	206	49.00	354	9.715	374	55.65	150
24.5	22.093	213	44.34	37	23.45	14	63.83	376	55.104	142	52.66	366	10.018	303	57.39	174
34.5	22.255	162	44.85	51	23.51	6	67.61	378	55.180	76	56.32	366	10.239	221	59.29	190
Mean Place	15.287		49.17		19.858		64.03		51.096		52.06		0.597		63.62	
Sec δ, Tan δ	1.207		+0.676		2.119		−1.869		1.572		−1.214		1.916		+1.634	
$D_\psi \alpha$, $D_\omega \alpha$	+0.08		+0.01		+0.01		−0.03		+0.03		−0.02		+0.10		+0.02	
$D_\psi \delta$, $D_\omega \delta$	−0.1		+1.0		−0.1		+1.0		−0.1		+1.0		−0.1		+1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	θ Canis Majoris. Mag. 4.2				ε Canis Majoris. Mag. 1.6				ζ Geminorum. Var. 3.7–4.3				σ² Canis Majori Mag. 3.1		
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Decli- tion
	h m 6 50 s		° ′ −11 55 ″		h m 6 55 s		° ′ −28 51 ″		h m 6 59 s		° ′ +20 41 ″		h m 6 59 s		° −23 ″
Jan. 0.5	19.378	92	53.82	219	21.590	80	21.67	298	10.119	130	41.99	28	33.120	91	31.69
10.5	19.470	43	56.01	203	21.670	26	24.65	283	10.249	78	41.71	16	33.211	38	34.46
20.5	19.513	6	58.04	183	21.696	27	27.48	258	10.327	25	41.55	4	33.249	13	37.08
30.4	19.507	53	59.87	158	21.669	77	30.06	230	10.352	27	41.51	6	33.236	62	39.49
Feb. 9.4	19.454	93	61.45	132	21.592	122	32.36	195	10.325	74	41.57	12	33.174	107	41.62
19.4	19.361	130	62.77	103	21.470	160	34.31	158	10.251	114	41.69	16	33.067	143	43.43
29.3	19.231	156	63.80	74	21.310	188	35.89	119	10.137	144	41.85	17	32.924	172	44.89
Mar. 10.3	19.075	173	64.54	46	21.122	206	37.08	77	9.993	165	42.02	16	32.752	191	45.99
20.3	18.902	180	65.00	17	20.916	216	37.85	36	9.828	174	42.18	13	32.561	199	46.72
30.3	18.722	177	65.17	11	20.700	212	38.21	3	9.654	172	42.31	10	32.362	198	47.05
Apr. 9.2	18.545	163	65.06	38	20.488	201	38.18	45	9.482	160	42.41	5	32.164	188	47.03
19.2	18.382	144	64.68	65	20.287	182	37.73	84	9.322	139	42.46	1	31.976	168	46.63
29.2	18.238	117	64.03	89	20.105	153	36.89	120	9.183	111	42.47	3	31.808	143	45.88
May 9.2	18.121	84	63.14	113	19.952	120	35.69	154	9.072	76	42.44	5	31.665	110	44.79
19.1	18.037	50	62.01	132	19.832	83	34.15	182	8.996	38	42.39	6	31.555	74	43.41
29.1	17.987	12	60.69	150	19.749	45	32.33	208	8.958	1	42.33	7	31.481	37	41.75
June 8.1	17.975	27	59.19	164	19.704	2	30.25	228	8.959	42	42.26	6	31.444	2	39.86
18.0	18.002	64	57.55	174	19.702	39	27.97	242	9.001	81	42.20	5	31.446	42	37.78
28.0	18.066	99	55.81	178	19.741	79	25.55	249	9.082	119	42.15	6	31.488	81	35.57
July 8.0	18.165	134	54.03	177	19.820	118	23.06	249	9.201	155	42.09	5	31.569	118	33.28
18.0	18.299	165	52.26	170	19.938	154	20.57	241	9.356	185	42.04	7	31.687	152	31.02
27.9	18.464	193	50.56	156	20.092	187	18.16	224	9.541	215	41.97	10	31.839	183	28.80
Aug. 6.9	18.657	218	49.00	138	20.279	219	15.92	200	9.756	239	41.87	14	32.022	213	26.76
16.9	18.875	240	47.62	112	20.498	245	13.92	167	9.995	262	41.73	21	32.235	237	24.92
26.9	19.115	259	46.50	81	20.743	270	12.25	129	10.257	280	41.52	28	32.472	261	23.40
Sept. 5.8	19.374	274	45.69	47	21.013	287	10.96	83	10.537	297	41.24	37	32.733	279	22.23
15.8	19.648	286	45.22	8	21.300	304	10.13	33	10.834	309	40.87	47	33.012	293	21.49
25.8	19.934	294	45.14	34	21.604	314	9.80	20	11.143	319	40.40	57	33.305	305	21.22
Oct. 5.7	20.228	298	45.48	75	21.918	318	10.00	74	11.462	325	39.83	65	33.610	310	21.43
15.7	20.526	298	46.23	113	22.236	318	10.74	126	11.787	327	39.18	74	33.920	310	22.15
25.7	20.824	292	47.36	150	22.554	309	12.00	175	12.114	324	38.44	77	34.230	304	23.36
Nov. 4.7	21.116	280	48.86	180	22.863	295	13.75	218	12.438	314	37.67	79	34.534	291	25.03
14.6	21.396	261	50.66	205	23.158	271	15.93	255	12.752	297	36.88	76	34.825	271	27.10
24.6	21.657	236	52.71	222	23.429	243	18.48	282	13.049	275	36.12	71	35.096	243	29.50
Dec. 4.6	21.893	203	54.93	232	23.672	204	21.30	299	13.324	242	35.41	62	35.339	208	32.16
14.6	22.096	163	57.25	233	23.876	159	24.29	308	13.566	203	34.79	51	35.547	166	34.97
24.5	22.259	119	59.58	227	24.035	111	27.37	306	13.769	158	34.28	37	35.713	120	37.86
34.5	22.378		61.85		24.146		30.43		13.927		33.91		35.833		40.71
Mean Place	17.260		56.87		19.459		25.31		7.687		40.18		31.015		35.14
Sec δ, Tan δ	1.022		−0.211		1.142		−0.551		1.069		+0.378		1.092		−0.43
Dψ α, Dω α	*+0.06*		0.00		+0.05		−0.01		+0.07		+0.01		+0.05		−0.01
Dψ δ, Dω δ	*−0.1*		+1.0		−0.1		+1.0		−0.1		+1.0		−0.1		+1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	**γ Canis Majoris.** Mag. 4.1				**δ Canis Majoris.** Mag. 2.0				**63 Aurigæ.** Mag. 5.1				**51 Geminorum.** Mag. 5.3			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 6 59		° ′ −15 30		h m 7 4		° ′ −26 15		h m 7 5		° ′ +39 27		h m 7 8		° ′ +16 18	
	s		″		s		″		s		″		s		″	
Jan. 0.5	59.609	99	26.97	241	60.601	93	29.12	292	55.789	160	32.22	88	35.321	135	10.37	60
10.5	59.708	49	29.38	225	60.694	41	32.04	276	55.949	96	33.10	98	35.456	84	9.77	46
20.5	59.757	— 2	31.63	204	60.735	— 12	34.80	254	56.045	34	34.08	101	35.540	33	9.31	32
30.4	59.755	48	33.67	179	60.723	63	37.34	225	56.079	— 29	35.12	106	35.573	— 18	8.99	18
Feb. 9.4	59.707	92	35.46	150	60.660	107	39.59	195	56.050	87	36.18	102	35.555	65	8.81	8
19.4	59.615	128	36.96	120	60.553	145	41.54	158	55.963	136	37.20	91	35.490	105	8.73	0
29.4	59.487	157	38.16	89	60.408	176	43.12	119	55.827	175	38.11	75	35.385	135	8.73	6
Mar. 10.3	59.330	174	39.05	58	60.232	195	44.31	81	55.652	200	38.86	56	35.250	157	8.79	9
20.3	59.156	183	39.63	25	60.037	205	45.12	42	55.452	214	39.42	34	35.093	169	8.88	11
30.3	58.973	182	39.88	— 5	59.832	205	45.54	4	55.238	213	39.76	11	34.924	167	8.99	12
Apr. 9.2	58.791	170	39.83	36	59.627	195	45.58	— 36	55.025	201	39.87	— 14	34.757	158	9.11	13
19.2	58.621	152	39.47	65	59.432	176	45.22	74	54.824	177	39.73	35	34.599	139	9.24	12
29.2	58.469	126	38.82	92	59.256	151	44.48	108	54.647	146	39.38	56	34.460	113	9.36	12
May 9.2	58.343	96	37.90	118	59.105	119	43.40	140	54.501	105	38.82	74	34.347	80	9.48	12
19.1	58.247	60	36.72	140	58.986	83	42.00	169	54.396	60	38.08	89	34.267	45	9.60	14
29.1	58.187	23	35.32	161	58.903	47	40.31	194	54.336	13	37.19	100	34.222	7	9.74	15
June 8.1	58.164	— 13	33.71	175	58.856	6	38.37	215	54.323	— 36	36.19	109	34.215	— 32	9.89	16
18.1	58.177	52	31.96	186	58.850	— 34	36.22	228	54.359	84	35.10	114	34.247	71	10.05	17
28.0	58.229	88	30.10	192	58.884	72	33.94	236	54.443	130	33.96	116	34.318	106	10.22	18
July 8.0	58.317	123	28.18	102	58.956	111	31.58	237	54.573	173	32.80	117	34.424	140	10.40	17
18.0	58.440	155	26.26	185	59.067	145	29.21	230	54.746	212	31.63	116	34.564	172	10.57	14
27.9	58.595	184	24.41	171	59.212	179	26.91	215	54.958	248	30.47	112	34.736	201	10.71	9
Aug. 6.9	58.779	211	22.70	152	59.391	207	24.76	193	55.206	279	29.35	108	34.937	225	10.80	3
16.9	58.990	234	21.18	125	59.598	235	22.83	162	55.485	308	28.27	103	35.162	247	10.83	— 7
26.9	59.224	255	19.93	94	59.833	260	21.21	125	55.793	330	27.24	98	35.409	268	10.76	18
Sept. 5.8	59.479	272	18.99	55	60.093	280	19.96	82	56.123	352	26.26	91	35.677	283	10.58	31
15.8	59.751	285	18.44	14	60.373	295	19.14	34	56.475	369	25.35	83	35.960	298	10.27	45
25.8	60.036	296	18.30	— 29	60.668	309	18.80	— 17	56.844	380	24.52	73	36.258	309	9.82	59
Oct. 5.8	60.332	301	18.59	73	60.977	314	18.97	68	57.224	388	23.79	64	36.567	316	9.23	73
15.7	60.633	302	19.32	116	61.291	315	19.65	121	57.612	392	23.15	51	36.883	320	8.50	84
25.7	60.935	298	20.48	155	61.606	310	20.86	167	58.004	388	22.64	37	37.203	318	7.66	94
Nov. 4.7	61.233	287	22.03	188	61.916	297	22.53	210	58.392	378	22.27	19	37.521	309	6.72	99
14.6	61.520	268	23.91	217	62.213	278	24.63	246	58.770	358	22.08	1	37.830	296	5.73	101
24.6	61.788	243	26.08	236	62.491	249	27.09	273	59.128	331	22.07	— 19	38.126	275	4.72	98
Dec. 4.6	62.031	210	28.44	249	62.740	213	29.82	290	59.459	293	22.26	39	38.401	243	3.74	93
14.6	62.241	171	30.93	252	62.953	172	32.72	299	59.752	246	22.65	59	38.644	206	2.81	81
24.5	62.412	126	33.45	249	63.125	123	35.71	298	59.998	194	23.24	77	38.850	160	2.00	69
34.5	62.538		35.94		63.248		38.69		60.192		24.01		39.010		1.31	
Mean Place	57.505		30.09		58.493		32.77		52.857		31.38		32.969		8.93	
Sec δ, Tan δ	1.038		−0.277		1.115		−0.493		1.295		+0.823		1.042		+0.292	
Dψ α, Dω α	+0.05		0.00		+0.05		−0.01		+0.08		+0.02		+0.08		+0.01	
Dψ δ, Dω δ	−0.1		+1.0		−0.1		+1.0		−0.1		+1.0		−0.1		+1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ^2 **Volantis.** Mag. 3.9				λ **Geminorum.** Mag. 3.6				π **Argus.** Mag. 2.7				δ **Geminorum.** Mag. 3.5			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 7 9		° ′ −70 21		h m 7 13		° ′ +16 41		h m 7 14		° ′ −36 56		h m 7 15		° ′ +22 8	
	s		″		s		″		s		″		s		″	
Jan. 0.5	31.36		39.81		18.378		35.31		12.721		42.14		8.951		17.60	
		0		381		140		59		92		333		148		24
10.5	31.36		43.62		18.518		34.72		12.813		45.47		9.099		17.36	
		13		370		89		44		35		321		94		11
20.5	31.23		47.32		18.607		34.28		12.848	—	48.68		9.193		17.25	—
		26		352		37		30		24		298		41		3
30.4	30.97		50.84		18.644	—	33.98		12.824		51.66		9.234	—	17.28	
		37		321		14		16		79		270		12		14
Feb. 9.4	30.60		54.05		18.630		33.82		12.745		54.36		9.222		17.42	
		46		284		61		6		129		236		61		21
19.4	30.14		56.89		18.569		33.76	—	12.616		56.72		9.161		17.63	
		55		243		103		2		171		195		104		26
29.4	29.59		59.32		18.466		33.78		12.445		58.67		9.057		17.89	
		62		194		133		8		205		154		136		27
Mar. 10.3	28.97		61.26		18.333		33.86		12.240		60.21		8.921		18.16	
		66		145		156		11		226		109		161		24
20.3	28.31		62.71		18.177		33.97		12.014		61.30		8.760		18.40	
		68		89		168		13		240		64		173		21
30.3	27.63		63.60		18.009		34.10		11.774		61.94		8.587		18.61	
		69		38		167		13		242		18		173		16
Apr. 9.3	26.94		63.98	—	17.842		34.23		11.532		62.12	—	8.414		18.77	
		68		16		159		13		233		26		164		9
19.2	26.26		63.82		17.683		34.36		11.299		61.86		8.250		18.86	
		65		68		141		12		214		71		146		3
29.2	25.61		63.14		17.542		34.48		11.085		61.15		8.104		18.89	—
		60		120		115		12		191		112		119		2
May 9.2	25.01		61.94		17.427		34.60		10.894		60.03		7.985		18.87	
		54		166		83		11		157		151		87		7
19.1	24.47		60.28		17.344		34.71		10.737		58.52		7.898		18.80	
		46		209		48		12		121		184		52		11
29.1	24.01		58.19		17.296		34.83		10.616		56.68		7.846		18.69	
		37		246		10		14		80		216		12		13
June 8.1	23.64		55.73		17.286	—	34.97		10.536		54.52		7.834	—	18.56	
		28		277		28		13		39		239		28		16
18.1	23.36		52.96		17.314		35.10		10.497	—	52.13		7.862		18.40	
		18		301		65		15		5		260		67		16
28.0	23.18		49.95		17.379		35.25		10.502		49.53		7.929		18.24	
		8		317		102		14		48		269		105		18
July 8.0	23.10	—	46.78		17.481		35.39		10.550		46.84		8.034		18.06	
		4		322		136		13		91		272		139		20
18.0	23.14		43.56		17.617		35.52		10.641		44.12		8.173		17.86	
		15		317		168		11		133		267		172		21
28.0	23.29		40.39		17.785		35.63		10.774		41.45		8.345		17.65	
		25		304		196		5		172		251		203		26
Aug. 6.9	23.54		37.35		17.981		35.68	—	10.946		38.94		8.548		17.39	
		35		281		222		1		208		229		227		30
16.9	23.89		34.54		18.203		35.67		11.154		36.65		8.775		17.09	
		45		245		244		11		239		197		253		36
26.9	24.34		32.09		18.447		35.56		11.393		34.68		9.028		16.73	
		52		200		265		23		271		157		273		44
Sept. 5.8	24.86		30.09		18.712		35.33		11.664		33.11		9.301		16.29	
		60		150		282		35		296		110		290		52
15.8	25.46		28.59		18.994		34.98		11.960		32.01		9.591		15.77	
		65		91		296		48		316		57		307		60
25.8	26.11		27.68		19.290		34.50		12.276		31.44	—	9.898		15.17	
		68		27		309		62		331		1		319		70
Oct. 5.8	26.79		27.41	—	19.599		33.88		12.607		31.45		10.217		14.47	
		69		39		317		77		340		57		327		77
15.7	27.48		27.80		19.916		33.11		12.947		32.02		10.544		13.70	
		68		108		320		87		342		116		332		82
25.7	28.16		28.88		20.236		32.24		13.289		33.18		10.876		12.88	
		66		170		321		96		337		171		332		85
Nov. 4.7	28.82		30.58		20.557		31.28		13.626		34.89		11.208		12.03	
		60		228		313		100		322		221		324		86
14.7	29 42		32.86		20.870		30.28		13.948		37.10		11.532		11.17	
		52		281		299		102		299		263		310		80
24.6	29.94		35.67		21.169		29.26		14.247		39.73		11.842		10.37	
		44		323		278		99		267		298		290		73
Dec. 4.6	30.38		38.90		21.447		28.27		14.514		42.71		12.132		9.64	
		32		355		248		92		227		321		258		63
14.6	30.70		42.45		21.695		27.35		14.741		45.92		12.390		9.01	
		21		374		211		81		180		335		221		50
24.5	30.91		46.19		21.906		26.54		14.921		49.27		12.611		8.51	
		8		383		167		68		127		338		175		35
34.5	30.99		50.02		22.073		25.86		15.048		52.65		12.786		8.16	
Mean Place	27.782		45.79		16.021		34.15		10.561		46.56		6.499		16.82	
Sec δ, Tan δ	2.975		−2.803		1.044		+0.300		1.251		−0.752		1.080		+0.407	
$D_\psi \alpha$, $D_\omega \alpha$	−0.01		−0.06		+0.07		+0.01		+0.04		−0.02		+0.07		+0.01	
$D_\psi \delta$, $D_\omega \delta$	−0.1		+1.0		−0.1		+0.9		−0.1		+0.9		−0.1		+0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	δ Volantis. Mag. 4.0				ι Geminorum. Mag. 3.9				η Canis Majoris. Mag. 2.4				Groombridge 1308. Mag. 5.8			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 7 16		° ′ −67 47		h m 7 20		° ′ +27 57		h m 7 20		° ′ −29 8		h m 7 22		° ′ +68 38	
	s		″		s		″		s		″		s		″	
Jan. 0.5	56.23		66.48		33.282		57.92		48.490		14.70		14.89		18.75	
		4		384		160		9		108		306		29		236
10.5	56.27	—	70.32		33.442		58.01		48.598		17.76		15.18		21.11	
		9		375		105		26		55		295		16		248
20.5	56.18		74.07		33.547		58.27		48.653	—	20.71		15.34		23.59	
		19		356		47		37		1		274		3		250
30.4	55.99		77.63		33.594	—	58.64		48.652		23.45		15.37	—	26.09	
		30		327		7		46		52		247		9		242
Feb. 9.4	55.69		80.90		33.587		59.10		48.600		25.92		15.28		28.51	
		39		293		60		51		100		214		21		222
19.4	55.30		83.83		33.527		59.61		48.500		28.06		15.07		30.73	
		46		250		105		51		140		178		32		197
29.4	54.84		86.33		33.422		60.12		48.360		29.84		14.75		32.70	
		54		204		140		48		173		141		40		159
Mar. 10.3	54.30		88.37		33.282		60.60		48.187		31.25		14.35		34.29	
		57		153		167		41		195		100		45		117
20.3	53.73		89.90		33.115		61.01		47.992		32.25		13.90		35.46	
		59		101		180		32		209		59		50		71
30.3	53.14		90.91		32.935		61.33		47.783		32.84		13.40		36.17	
		60		47		183		19		210		18		51		21
Apr. 9.3	52.54		91.38	—	32.752		61.52		47.573		33.02	—	12.89		36.38	—
		60		7		174		7		204		23		49		28
19.2	51.94		91.31		32.578		61.59	—	47.369		32.79		12.40		36.10	
		57		59		155		5		188		61		46		76
29.2	51.37		90.72		32.423		61.54		47.181		32.18		11.94		35.34	
		53		110		129		16		165		99		40		120
May 9.2	50.84		89.62		32.294		61.38		47.016		31.19		11.54		34.14	
		46		157		97		27		136		133		32		160
19.1	50.38		88.05		32.197		61.11		46.880		29.86		11.22		32.54	
		41		202		58		35		101		165		25		193
29.1	49.97		86.03		32.139		60.76		46.779		28.21		10.97		30.61	
		34		239		19		41		63		192		15		222
June 8.1	49.63		83.64		32.120	—	60.35		46.716		26.29		10.82		28.39	
		25		272		23		47		25		215		6		242
18.1	49.38		80.92		32.143		59.88		46.691	—	24.14		10.76	—	25.97	
		15		298		63		51		14		230		4		258
28.0	49.23		77.94		32.206		59.37		46.705		21.84		10.80		23.39	
		7		312		103		53		53		241		16		266
July 8.0	49.16	—	74.82		32.309		58.84		46.758		19.43		10.96		20.73	
		3		321		140		56		91		244		24		267
18.0	49.19		71.61		32.449		58.28		46.849		16.99		11.20		18.06	
		13		318		175		58		129		239		33		264
28.0	49.32		68.43		32.624		57.70		46.978		14.60		11.53		15.42	
		22		305		206		60		164		226		41		253
Aug. 6.9	49.54		65.38		32.830		57.10		47.142		12.34		11.94		12.89	
		30		283		233		63		197		203		50		240
16.9	49.84		62.55		33.063		56.47		47.339		10.31		12.44		10.49	
		40		249		260		65		225		176		56		221
26.9	50.24		60.06		33.323		55.82		47.564		8.55		13.00		8.28	
		46		207		282		70		253		140		62		198
Sept. 5.8	50.70		57.99		33.605		55.12		47.817		7.15		13.62		6.30	
		53		155		302		74		275		96		67		171
15.8	51.23		56.44		33.907		54.38		48.092		6.19		14.29		4.59	
		58		97		318		76		295		47		71		142
25.8	51.81		55.47		34.225		53.62		48.387		5.72	—	15.00		3.17	
		61		34		331		80		311		6		74		107
Oct. 5.8	52.42		55.13	—	34.556		52.82		48.698		5.78		15.74		2.10	
		62		32		342		81		319		58		76		72
15.7	53.04		55.45		34.898		52.01		49.017		6.36		16.50		1.38	
		63		99		347		81		324		112		77		33
25.7	53.67		56.44		35.245		51.20		49.341		7.48		17.27		1.05	—
		60		163		348		77		321		162		77		7
Nov. 4.7	54.27		58.07		35.593		50.43		49.662		9.10		18.04		1.12	
		56		223		342		71		309		208		73		47
14.7	54.83		60.30		35.935		49.72		49.971		11.18		18.77		1.59	
		49		276		327		61		292		247		70		90
24.6	55.32		63.06		36.262		49.11		50.263		13.65		19.47		2.49	
		41		321		306		50		265		278		64		130
Dec. 4.6	55.73		66.27		36.568		48.61		50.528		16.43		20.11		3.79	
		32		353		274		35		229		299		57		166
14.6	56.05		69.80		36.842		48.26		50.757		19.42		20.68		5.45	
		22		375		236		17		189		311		46		197
24.5	56.27		73.55		37.078		48.09		50.946		22.53		21.14		7.42	
		11		384		189		1		139		312		36		224
34.5	56.38		77.39		37.267		48.08		51.085		25.65		21.50		9.66	
Mean Place	52.978		72.73		30.708		57.79		46.397		18.70		9.238		19.97	
Sec δ, Tan δ	2.647		−2.451		1.133		+0.531		1.145		−0.557		2.746		+2.556	
$D_\psi \alpha$, $D_\omega \alpha$	0.00		−0.05		+0.07		+0.01		+0.05		−0.01		+0.13		+0.06	
$D_\psi \delta$, $D_\omega \delta$	−0.1		+0.9		−0.1		+0.9		−0.1		+0.9		−0.1		+0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Canis Minoris. Mag. 3.1				ρ Geminorum. Mag. 4.2				σ Argus. Mag. 3.3				α² Geminorum. (*Castor.*) Mag. 2.0			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 7 22		° ′ + 8 27		h m 7 23		° ′ +31 56		h m 7 26		° ′ −43 7		h m 7 29		° ′ +32 4	
	s		″		s		″		s		″		s		″	
Jan. 0.5	38.030	142	35.23	112	45.328	169	69.59	35	36.103	102	45.71	353	17.243	174	26.01	33
10.5	38.172	92	34.11	98	45.497	113	69.94	49	36.205	38	49.24	344	17.417	118	26.34	48
20.5	38.264	41	33.13	81	45.610	53	70.43	61	36.243	24	52.68	325	17.535	59	26.82	61
30.5	38.305	8	32.32	63	45.663	6	71.04	71	36.219	84	55.93	296	17.594	1	27.43	70
Feb. 9.4	38.297	55	31.69	48	45.657	59	71.75	72	36.135	139	58.89	262	17.593	54	28.13	74
19.4	38.242	93	31.21	33	45.598	107	72.47	69	35.996	186	61.51	222	17.539	103	28.87	71
29.4	38.149	127	30.88	18	45.491	144	73.16	63	35.810	223	63.73	180	17.436	141	29.58	66
Mar. 10.3	38.022	149	30.70	8	45.347	172	73.79	53	35.587	251	65.53	133	17.295	171	30.24	56
20.3	37.873	161	30.62	2	45.175	187	74.32	40	35.336	266	66.86	85	17.124	186	30.80	42
30.3	37.712	163	30.64	11	44.988	191	74.72	23	35.070	270	67.71	38	16.938	191	31.22	26
Apr. 9.3	37.549	156	30.75	19	44.797	182	74.95	7	34.800	265	68.09	11	16.747	184	31.48	10
19.2	37.393	140	30.94	27	44.615	165	75.02	9	34.535	248	67.98	58	16.563	166	31.58	7
29.2	37.253	116	31.21	32	44.450	136	74.93	25	34.287	224	67.40	103	16.397	142	31.51	23
May 9.2	37.137	88	31.53	40	44.314	103	74.68	38	34.063	193	66.37	144	16.255	107	31.28	37
19.2	37.049	55	31.93	45	44.211	64	74.30	50	33.870	156	64.93	184	16.148	69	30.91	49
29.1	36.994	19	32.38	51	44.147	23	73.80	59	33.714	115	63.09	218	16.079	29	30.42	61
June 8.1	36.975	17	32.89	55	44.124	19	73.21	67	33.599	70	60.91	245	16.050	13	29.81	68
18.1	36.992	52	33.44	59	44.143	62	72.54	74	33.529	24	58.46	267	16.063	55	29.13	74
28.0	37.044	87	34.03	59	44.205	103	71.80	77	33.505	23	55.79	281	16.118	95	28.39	79
July 8.0	37.131	121	34.62	59	44.308	141	71.03	79	33.528	70	52.98	286	16.213	136	27.60	83
18.0	37.252	150	35.21	54	44.449	178	70.24	82	33.598	116	50.12	283	16.349	171	26.77	85
28.0	37.402	179	35.75	47	44.627	211	69.42	83	33.714	160	47.29	272	16.520	205	25.92	87
Aug. 6.9	37.581	205	36.22	37	44.838	240	68.59	84	33.874	201	44.57	249	16.725	233	25.05	89
16.9	37.786	228	36.59	21	45.078	267	67.75	85	34.075	241	42.08	218	16.958	263	24.16	90
26.9	38.014	247	36.80	6	45.345	290	66.90	85	34.316	275	39.90	178	17.221	285	23.26	91
Sept. 5.9	38.261	268	36.86	15	45.635	312	66.05	87	34.591	307	38.12	131	17.506	309	22.35	93
15.8	38.529	282	36.71	34	45.947	330	65.18	87	34.898	331	36.81	78	17.815	325	21.42	92
25.8	38.811	294	36.37	57	46.277	343	64.31	86	35.229	351	36.03	19	18.140	342	20.50	92
Oct. 5.8	39.105	306	35.80	80	46.620	356	63.45	84	35.580	363	35.84	43	18.482	354	19.58	90
15.7	39.411	310	35.00	100	46.976	361	62.61	78	35.943	368	36.27	103	18.836	361	18.68	85
25.7	39.721	311	34.00	116	47.337	362	61.83	71	36.311	363	37.30	162	19.197	363	17.83	77
Nov. 4.7	40.032	305	32.84	129	47.699	355	61.12	61	36.674	349	38.92	217	19.560	356	17.06	65
14.7	40.337	293	31.55	138	48.054	342	60.51	48	37.023	325	41.09	265	19.916	345	16.41	53
24.6	40.630	274	30.17	141	48.396	318	60.03	31	37.348	291	43.74	303	20.261	324	15.88	37
Dec. 4.6	40.904	245	28.76	140	48.714	289	59.72	15	37.639	248	46.77	331	20.585	292	15.51	18
14.6	41.149	210	27.36	133	49.003	247	59.57	4	37.887	197	50.08	350	20.877	252	15.33	1
24.6	41.359	167	26.03	122	49.250	199	59.61	24	38.084	138	53.58	356	21.129	204	15.34	21
34.5	41.526		24.81		49.449		59.85		38.222		57.14		21.333		15.55	
Mean Place	35.794		34.04		42.652		69.91		33.898		50.87		14.569		26.76	
Sec δ, Tan δ	1.011		+0.149		1.178		+0.624		1.370		−0.937		1.180		+0.627	
Dψ α, Dω α	+0.07		0.00		+0.08		+0.01		+0.05		−0.02		+0.08		+0.02	
Dψ δ, Dω δ	*−0.1*		*+0.9*		−0.1		+0.9		−0.1		+0.9		−0.2		+0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	25 Monocerotis. Mag. 5.2				*α* Canis Minoris. (*Procyon.*) Mag. 0.5				24 Lyncis. Mag. 5.0				*κ* Geminorum. Mag. 3.7			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 7 33		° ′ − 3 55		h m 7 34		° ′ + 5 26		h m 7 35		° ′ +58 54		h m 7 39		° ′ +24 35	
	s		″		s		″		s		″		s		″	
Jan. 0.5	8.192		19.23		56.463		28.21		58.630		27.14		25.224		60.23	
10.5	8.333	141	21.12	189	56.609	146	26.84	137	58.885	255	28.97	183	25.400	176	60.04	19
20.5	8.425	92	22.86	174	56.706	97	25.64	120	59.050	165	30.97	200	25.522	122	60.03	1
30.5	8.468	43	24.41	155	56.752	46	24.61	103	59.121	71	33.05	208	25.589	67	60.18	15
Feb. 9.4	8.461	7	25.76	135	56.749	3	23.76	85	59.099	22	35.12	207	25.601	12	60.46	28
19.4	8.409	52	26.87	111	56.700	49	23.11	65	58.991	108	37.09	197	25.561	40	60.82	36
29.4	8.317	92	27.76	89	56.609	91	22.64	47	58.804	187	38.88	179	25.474	87	61.24	42
Mar. 10.4	8.192	125	28.40	64	56.486	123	22.32	32	58.553	251	40.39	151	25.349	125	61.67	43
20.3	8.045	147	28.84	44	56.341	145	22.17	15	58.255	298	41.57	118	25.198	151	62.08	41
30.3	7.884	161	29.04	20	56.181	160	22.13	4	57.928	327	42.37	80	25.028	170	62.43	35
Apr. 9.3	7.719	165	29.05	1	56.018	163	22.21	8	57.588	340	42.76	39	24.854	174	62.71	28
19.2	7.559	160	28.84	21	55.861	157	22.40	19	57.254	334	42.74	2	24.686	168	62.89	18
29.2	7.413	146	28.46	38	55.718	143	22.69	29	56.944	310	42.30	44	24.531	155	62.98	9
May 9.2	7.289	124	27.90	56	55.598	120	23.07	38	56.671	273	41.46	84	24.398	133	62.98	0
19.2	7.191	98	27.17	73	55.504	94	23.53	46	56.447	224	40.27	119	24.295	103	62.89	9
29.1	7.124	67	26.29	88	55.443	61	24.06	53	56.280	167	38.78	149	24.226	69	62.73	16
June 8.1	7.090	34	25.27	102	55.415	28	24.67	61	56.178	102	37.01	177	24.194	32	62.49	24
18.1	7.089	1	24.15	112	55.423	8	25.33	66	56.144	34	35.03	198	24.200	6	62.20	29
28.1	7.124	35	22.94	121	55.464	41	26.02	69	56.177	33	32.89	214	24.243	43	61.87	33
July 8.0	7.192	68	21.70	124	55.541	77	26.72	70	56.280	103	30.66	223	24.325	82	61.50	37
18.0	7.292	100	20.45	125	55.650	109	27.41	69	56.449	169	28.37	229	24.442	117	61.09	41
28.0	7.424	132	19.27	118	55.789	139	28.04	63	56.681	232	26.09	228	24.593	151	60.63	46
Aug. 6.9	7.585	161	18.16	111	55.957	168	28.60	56	56.971	290	23.83	226	24.775	182	60.13	50
16.9	7.771	186	17.19	97	56.150	193	29.04	44	57.314	343	21.66	217	24.985	210	59.58	55
26.9	7.983	212	16.44	75	56.368	218	29.32	28	57.706	392	19.62	204	25.221	236	58.96	62
Sept. 5.9	8.216	233	15.91	53	56.606	238	29.42	10	58.141	435	17.72	190	25.482	261	58.26	70
15.8	8.470	254	15.67	24	56.865	259	29.30	12	58.613	472	16.02	170	25.763	281	57.50	76
25.8	8.741	271	15.74	7	57.139	274	28.94	36	59.118	505	14.53	149	26.064	301	56.67	83
Oct. 5.8	9.027	286	16.14	40	57.428	289	28.33	61	59.649	531	13.29	124	26.381	317	55.77	90
15.8	9.323	296	16.89	75	57.727	299	27.48	85	60.198	549	12.32	97	26.710	329	54.81	96
25.7	9.628	305	17.96	107	58.035	308	26.39	109	60.758	560	11.67	65	27.049	339	53.83	98
Nov. 4.7	9.933	305	19.32	136	58.343	308	25.10	129	61.318	560	11.35	32	27.391	342	52.83	100
14.7	10.233	300	20.94	162	58.647	304	23.65	145	61.870	552	11.36	1	27.730	339	51.87	96
24.6	10.523	290	22.76	182	58.940	293	22.09	156	62.397	527	11.75	39	28.060	330	50.98	89
Dec. 4.6	10.793	270	24.72	196	59.215	275	20.47	162	62.889	492	12.50	75	28.369	309	50.20	78
14.6	11.037	244	26.74	202	59.462	247	18.85	162	63.331	442	13.61	111	28.653	284	49.56	64
24.6	11.245	208	28.77	203	59.675	213	17.29	156	63.708	377	15.02	141	28.900	247	49.08	48
34.5	11.412	167	30.73	196	59.846	171	15.83	146	64.011	303	16.72	170	29.103	203	48.77	31
Mean Place	6.082		21.06		54.334		27.47		54.485		29.69		22.749		61.18	
Sec δ, Tan δ	1.002		−0.069		1.005		+0.095		1.936		+1.657		1.100		+0.458	
$D_\phi \alpha$, $D_\omega \alpha$	+0.06		0.00		+0.06		0.00		+0.10		+0.04		+0.07		+0.01	
$D_\phi \delta$, $D_\omega \delta$	−0.2		+0.9		−0.2		+0.9		−0.2		+0.9		−0.2		+0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Geminorum. (*Pollux.*) Mag. 1.2				4 Puppis. Mag. 5.1				ξ Argus. Mag. 3.5				φ Geminorum. Mag. 5.0			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	7 40		+28 13		7 42		−14 21		7 45		−24 38		7 48		+26 58	
	s		″		s		″		s		″		s		″	
Jan. 0.5	13.251		46.88		6.843		29.26		47.715		49.83		24.075		61.52	
10.5	13.431	180	46.91	3	6.985	142	31.73	247	47.855	140	52.79	296	24.263	188	61.45	7
20.5	13.556	125	47.14	23	7.077	92	34.06	233	47.943	88	55.63	284	24.396	133	61.57	12
30.5	13.625	69	47.50	36	7.119	42	36.20	214	47.977	34	58.29	266	24.473	77	61.85	28
Feb. 9.4	13.636	11	47.98	48	7.111	8	38.11	191	47.959	18	60.70	241	24.494	21	62.26	41
19.4	13.593	43	48.54	56	7.056	55	39.77	166	47.892	67	62.83	213	24.461	33	62.77	51
29.4	13.503	90	49.13	59	6.961	95	41.14	137	47.783	109	64.64	181	24.380	81	63.32	55
Mar. 10.4	13.374	129	49.70	57	6.832	129	42.20	106	47.640	143	66.09	145	24.259	121	63.87	55
20.3	13.215	159	50.21	51	6.678	154	42.97	77	47.469	171	67.17	108	24.109	150	64.38	51
30.3	13.040	175	50.64	43	6.509	169	43.44	47	47.283	186	67.87	70	23.941	168	64.82	44
Apr. 9.3	12.858	182	50.95	31	6.336	173	43.59	15	47.091	192	68.20	33	23.766	175	65.17	35
19.2	12.681	177	51.12	17	6.167	169	43.46	13	46.901	190	68.17	3	23.593	173	65.40	23
29.2	12.520	161	51.17	5	6.009	158	43.04	42	46.723	178	67.77	40	23.432	161	65.51	11
May 9.2	12.380	140	51.09	8	5.871	138	42.37	67	46.565	158	67.01	76	23.293	139	65.50	1
19.2	12.272	108	50.89	20	5.758	113	41.45	92	46.430	135	65.93	108	23.183	110	65.37	13
29.1	12.198	74	50.59	30	5.675	83	40.30	115	46.325	105	64.57	136	23.106	77	65.13	24
June 8.1	12.161	37	50.19	40	5.623	52	38.95	135	46.254	71	62.93	164	23.064	42	64.81	32
18.1	12.163	2	49.72	47	5.605	18	37.42	153	46.217	37	61.08	185	23.060	4	64.43	38
28.1	12.206	43	49.19	53	5.622	17	35.77	165	46.215	2	59.04	204	23.095	35	63.95	48
July 8.0	12.288	82	48.61	58	5.673	51	34.06	171	46.251	36	56.91	213	23.169	74	63.42	53
18.0	12.406	118	47.97	64	5.757	84	32.31	175	46.323	72	54.73	218	23.278	109	62.86	56
28.0	12.559	153	47.30	67	5.873	116	30.60	171	46.429	106	52.56	217	23.420	142	62.23	63
Aug. 6.9	12.744	185	46.58	72	6.020	147	28.99	161	46.568	139	50.50	206	23.595	175	61.55	68
16.9	12.959	215	45.83	75	6.196	176	27.53	146	46.741	173	48.60	190	23.801	206	60.82	73
26.9	13.200	241	45.04	79	6.398	202	26.31	122	46.943	202	46.96	164	24.035	234	60.04	78
Sept. 5.9	13.467	267	44.20	84	6.625	227	25.38	93	47.171	228	45.64	132	24.295	260	59.19	85
15.8	13.755	288	43.31	89	6.873	248	24.79	59	47.426	255	44.70	94	24.576	281	58.27	92
25.8	14.063	308	42.38	93	7.141	268	24.59	20	47.702	276	44.22	48	24.876	300	57.32	95
Oct. 5.8	14.388	325	41.42	96	7.429	288	24.79	20	47.998	296	44.21	1	25.194	318	56.32	100
15.8	14.726	338	40.44	98	7.728	299	25.42	63	48.308	310	44.71	50	25.528	334	55.27	105
25.7	15.072	346	39.47	97	8.035	307	26.48	106	48.626	318	45.71	100	25.874	346	54.23	104
Nov. 4.7	15.423	351	38.53	94	8.344	309	27.93	145	48.947	321	47.19	148	26.224	350	53.20	103
14.7	15.772	349	37.66	87	8.650	306	29.73	180	49.263	316	49.11	192	26.571	347	52.23	97
24.6	16.110	338	36.90	76	8.945	295	31.84	211	49.565	302	51.41	230	26.909	338	51.36	87
Dec. 4.6	16.429	319	36.27	63	9.219	274	34.16	232	49.847	282	54.02	261	27.230	321	50.61	75
14.6	16.719	290	35.81	46	9.466	247	36.64	248	50.098	251	56.84	282	27.526	296	50.04	57
24.6	16.972	253	35.54	27	9.678	212	39.18	254	50.312	214	59.79	295	27.785	259	49.66	38
34.5	17.180	208	35.45	9	9.846	168	41.71	253	50.479	167	62.77	298	27.999	214	49.46	20
Mean Place	10.693		48.17		4.799		31.95		45.688		53.64		21.559		63.30	
Sec δ, Tan δ	1.135		+0.537		1.032		−0.256		1.100		−0.459		1.122		+0.509	
$D_\psi \alpha$, $D_\omega \alpha$	+0.07		+0.02		+0.05		−0.01		+0.05		−0.01		+0.07		+0.02	
$D_\psi \delta$, $D_\omega \delta$	−0.2		+0.9		−0.2		+0.9		−0.2		+0.9		−0.2		+0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	**26 Lyncis.** Mag. 5.7				**Groombridge 1374.** Mag. 5.6				**χ Argus.** Mag. 3.6				**ω Cancri** Mag. 5.9			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	7 48		+47 46		7 50		+74 8		7 54		−52 45		7 55		+25 37	
	s		″		s		″		s		″		s		″	
Jan. 0.6	39.423		57.21		17.28		34.40		40.918		17.45		53.512		23.01	
10.5	39.653	230	58.39	118	17.72	44	36.84	244	41.055	137	21.23	378	53.705	193	22.83	18
20.5	39.815	162	59.76	137	18.00	28	39.49	265	41.119	64 —	24.97	374	53.846	141	22.83	0
30.5	39.903	88	61.25	149	18.11	11 —	42.21	272	41.108	11	28.59	362	53.930	84	23.02	19
Feb. 9.4	39.919	16 —	62.82	157	18.05	6	44.90	269	41.025	83	31.98	339	53.958	28 —	23.36	34
19.4	39.864	55	64.37	155	17.84	21	47.45	255	40.874	151	35.06	308	53.932	26	23.79	43
29.4	39.747	117	65.83	146	17.46	38	49.77	232	40.665	209	37.78	272	53.860	72	24.29	50
Mar. 10.4	39.578	169	67.13	130	16.97	49	51.73	196	40.409	256	40.09	231	53.747	113	24.81	52
20.3	39.369	209	68.20	107	16.39	58	53.28	155	40.115	294	41.93	184	53.603	144	25.32	51
30.3	39.134	235	69.00	80	15.74	65	54.35	107	39.797	318	43.28	135	53.439	164	25.78	46
Apr. 9.3	38.887	247	69.50	50	15.05	69	54.91	56	39.466	331	44.13	85	53.267	172	26.15	37
19.3	38.642	245	69.68	18 —	14.36	69	54.94	3 —	39.135	331	44.48	35 —	53.096	171	26.41	26
29.2	38.414	228	69.54	14	13.70	66	54.42	52	38.813	322	44.30	18	52.936	160	26.56	15
May 9.2	38.213	201	69.09	45	13.10	60	53.42	100	38.512	301	43.63	67	52.797	139	26.62	6 —
19.2	38.047	166	68.33	76	12.57	53	51.95	147	38.240	272	42.48	115	52.686	111	26.57	5
29.1	37.925	122	67.33	100	12.14	43	50.08	187	38.004	236	40.89	159	52.605	81	26.41	16
June 8.1	37.850	75	66.09	124	11.83	31	47.85	223	37.809	195	38.89	200	52.558	47	26.15	26
18.1	37.826	24 —	64.67	142	11.63	20	45.33	252	37.663	146	36.55	234	52.549	9 —	25.82	33
28.1	37.853	27	63.10	157	11.56	7 —	42.60	273	37.569	94	33.91	264	52.576	27	25.45	37
July 8.0	37.933	80	61.42	168	11.62	6	39.73	287	37.528	41 —	31.08	283	52.640	64	24.99	46
18.0	38.062	129	59.67	175	11.82	20	36.78	295	37.543	15	28.11	297	52.741	101	24.47	52
28.0	38.238	176	57.87	180	12.13	31	33.81	297	37.613	70	25.11	300	52.875	134	23.92	55
Aug. 7.0	38.458	220	56.07	180	12.56	43	30.89	292	37.739	126	22.16	295	53.041	166	23.29	63
16.9	38.718	260	54.28	179	13.10	54	28.07	282	37.920	181	19.38	278	53.238	197	22.59	70
26.9	39.016	298	52.55	173	13.75	65	25.43	264	38.154	234	16.87	251	53.461	223	21.84	75
Sept. 5.9	39.347	331	50.89	166	14.48	73	23.00	243	38.436	282	14.72	215	53.711	250	21.00	84
15.8	39.710	363	49.32	157	15.29	81	20.83	217	38.762	326	13.01	171	53.984	273	20.10	90
25.8	40.099	389	47.87	145	16.17	88	18.95	188	39.127	365	11.83	118	54.278	294	19.11	99
Oct. 5.8	40.510	411	46.55	132	17.11	94	17.44	151	39.523	396	11.24	59 —	54.590	312	18.07	104
15.8	40.939	429	45.43	112	18.08	97	16.31	113	39.940	417	11.29	5	54.917	327	16.98	109
25.7	41.381	442	44.50	93	19.08	100	15.60	71	40.369	429	11.98	69	55.258	341	15.86	112
Nov. 4.7	41.828	447	43.81	69	20.07	99	15.32	28 —	40.798	429	13.31	133	55.605	347	14.75	111
14.7	42.271	443	43.37	44	21.06	99	15.51	19	41.216	418	15.25	194	55.951	346	13.69	106
24.7	42.700	429	43.22	15 —	22.00	94	16.18	67	41.609	393	17.74	249	56.291	340	12.71	98
Dec. 4.6	43.106	406	43.38	16	22.87	87	17.31	113	41.966	357	20.69	295	56.614	323	11.86	85
14.6	43.476	370	43.83	45	23.65	78	18.87	156	42.274	308	24.01	332	56.911	297	11.18	68
24.6	43.801	325	44.58	75	24.32	67	20.82	195	42.523	249	27.61	360	57.174	263	10.67	51
34.5	44.068	267	45.59	101	24.84	52	23.10	228	42.705	182	31.35	374	57.395	221	10.34	33
Mean Place	36.153		60.54		10.049		38.80		38.618		24.32		51.041		25.16	
Sec δ, Tan δ	1.488		+1.102		3.660		+3.521		1.652		−1.315		1.109		+0.480	
$D_\psi\alpha$, $D_\omega\alpha$	+0.09		+0.03		+0.14		+0.11		+0.03		−0.04		+0.07		+0.02	
$D_\psi\delta$, $D_\omega\delta$	−0.2		+0.9		−0.2		+0.9		−0.2		+0.9		−0.2		+0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	χ Geminorum. Mag. 5.0				27 Lyncis. Mag. 4.9				ρ Argus. Mag. 2.9				3 H. Ursæ Mag.	
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.	
	h m		° ′		h m		° ′		h m		° ′		h m	
	7 58		+28 1		8 2		+51 44		8 3		−24 3		8 4	
	s		″		s		″		s		″		s	
Jan. 0.6	24.270		48.00		12.350		55.13		59.965		37.14		33.78	
10.5	24.470	200	47 95	5 —	12.614	264	56.44	131	60.124	159	40.09	295	34.17	39
20.5	24.616	146	48.10	15	12.803	189	57.99	155	60.233	109	42.96	287	34.44	27
30.5	24.704	88	48.43	33	12.914	111	59.70	171	60.287	54	45.66	270	34.58	14
Feb. 9.5	24.735	31 —	48.90	47	12.944	30 —	61.48	178	60.289	2 —	48.12	246	34.59	1 —
19.4	24.712	23	49.47	57	12.899	45	63.26	178	60.242	47	50.32	220	34.48	11
29.4	24.639	73	50.09	62	12.784	115	64.94	168	60.150	92	52.21	189	34.24	24
Mar. 10.4	24.524	115	50.72	63	12.611	173	66.46	152	60.020	130	53.75	154	33.92	32
20.3	24.379	145	51.31	59	12.391	220	67.74	128	59.862	158	54.94	119	33.51	41
30.3	24.212	167	51.83	52	12.138	253	68.73	99	59.687	175	55.76	82	33.05	46
Apr. 9.3	24.036	176	52.24	41	11.870	268	69.38	65	59.501	186	56.22	46	32.55	50
19.3	23.861	175	52.52	28	11.601	269	69.68	30 —	59.316	185	56.31	9 —	32.05	50
29.2	23.698	163	52.67	15	11.345	256	69.62	6	59.139	177	56.04	27	31.56	49
May 9.2	23.554	144	52.68	1 —	11.112	233	69.20	42	58.979	160	55.43	61	31.11	45
19.2	23.438	116	52.57	11	10.917	195	68.44	76	58.840	139	54.50	93	30.72	39
29.2	23.353	85	52.33	24	10.764	153	67.38	106	58.729	111	53.26	124	30.40	32
June 8.1	23.303	50	51.98	35	10.661	103	66.06	132	58.647	82	51.76	150	30.15	25
18.1	23.291	12 —	51.54	44	10.610	51 —	64.50	156	58.597	50	50.02	174	30.00	15
28.1	23.317	26	51.02	52	10.615	5	62.76	174	58.582	15 —	48.11	191	29.93	7 —
July 8.0	23.380	63	50.43	59	10.674	59	60.88	188	58.602	20	46.07	204	29.96	3
18.0	23.480	100	49.77	66	10.786	112	58.90	198	58.657	55	43.95	212	30.09	13
28.0	23.614	134	49.04	73	10.950	164	56.86	204	58.745	88	41.85	210	30.31	22
Aug. 7.0	23.781	167	48.27	77	11.162	212	54.79	207	58.867	122	39.83	202	30.62	31
16.9	23.979	198	47.43	84	11.420	258	52.74	205	59.022	155	37.95	188	31.00	38
26.9	24.204	225	46.54	89	11.720	300	50.73	201	59.206	184	36.31	164	31.47	47
Sept. 5.9	24.456	252	45.59	95	12.059	339	48.79	194	59.421	215	34.98	133	32.00	53
15.8	24.731	275	44.58	101	12.432	373	46.96	183	59.662	241	34.00	98	32.60	60
25.8	25.030	299	43.50	108	12.838	406	45.28	168	59.929	267	33.45	55	33.26	66
Oct. 5.8	25.346	316	42.39	111	13.271	433	43.76	152	60.216	287	33.38	7 —	33.96	70
15.8	25.680	334	41.26	113	13.726	455	42.44	132	60.522	306	33.79	41	34.69	73
25.7	26.026	346	40.13	113	14.197	471	41.37	107	60.839	317	34.70	91	35.45	76
Nov. 4.7	26.380	354	39.04	109	14.677	480	40.56	81	61.163	324	36.09	139	36.22	77
14.7	26.733	353	38.01	103	15.156	479	40.05	51	61.485	322	37.92	183	36.99	77
24.7	27.079	346	37.09	92	15.624	468	39.87	18 —	61.797	312	40.17	225	37.73	74
Dec. 4 6	27.410	331	36.32	77	16.070	446	40.04	17	62.091	294	42.72	255	38.43	70
14.6	27.715	305	35.72	60	16.479	409	40.54	50	62.357	266	45.49	277	39.07	64
24.6	27.985	270	35.32	40	16.840	361	41.38	84	62.588	231	48.41	292	39.62	55
34.5	28.212	227	35.13	19	17.141	301	42.54	116	62.776	188	51.38	297	40.07	45
Mean Place	21.749		50.57		8.868		59.99		57.982		40.92		28.232	
Sec δ, Tan δ	1.133		+0.532		1.615		+1.268		1.095		−0.447		2.755	
$D_\psi a$, $D_\omega a$	+0.07		+0.02		+0.09		+0.04		+0.05		−0.02		+0.12	
$D_\psi \delta$, $D_\omega \delta$	−0.2		+0.9		−0.2		+0.9		−0.2		+0.9		−0.2	

ashington ean Time.	γ Argus. Mag. 2.2				ζ Cancri (*mean*). Mag. 4.7				Bradley 1147. Mag. 5.7				20 Puppis. Mag. 5.0			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	8 6		−47 5		8 7		+17 53		8 9		+76 0		8 9		−15 31	
	s		″		s		″		s		″		s		″	
an. 0.6	58.831	159	12.52	368	26.092	195	65.46	74	9.43	55	47.34	239	30.293	169	61.28	258
10.5	58.990	90	16.20	366	26.287	145	64.72	50	9.98	37	49.73	265	30.462	121	63.86	247
20.5	59.080	25	19.86	354	26.432	89	64.22	32	10.35	19	52.38	277	30.583	69	66.33	230
30.5	59.105	43	23.40	334	26.521	38	63.90	14	10.54	1	55.15	279	30.652	18	68.63	208
Feb. 9.5	59.062	104	26.74	304	26.559	13	63.76	2	10.53	19	57.94	269	30.670	30	70.71	183
19.4	58.958	158	29.78	269	26.546	58	63.74	13	10.34	36	60.63	249	30.640	75	72.54	153
29.4	58.800	205	32.47	230	26.488	99	63.87	22	9.98	51	63.12	217	30.565	111	74.07	124
Mar. 10.4	58.595	240	34.77	186	26.389	131	64.09	29	9.47	64	65.29	176	30.454	138	75.31	94
20.3	58.355	265	36.63	138	26.258	147	64.38	31	8.83	71	67.05	131	30.316	157	76.25	62
30.3	58.090	278	38.01	93	26.111	158	64.69	30	8.12	77	68.36	79	30.159	168	76.87	32
Apr. 9.3	57.812	281	38.94	42	25.953	161	64.99	28	7.35	79	69.15	26	29.991	168	77.19	3
19.3	57.531	274	39.36	7	25.792	149	65.27	24	6.56	77	69.41	28	29.823	159	77.22	27
29.2	57.257	256	39.29	55	25.643	133	65.51	24	5.79	72	69.13	81	29.664	146	76.95	53
May 9.2	57.001	234	38.74	101	25.510	108	65.75	16	5.07	64	68.32	131	29.518	123	76.42	81
19.2	56.767	201	37.73	144	25.402	84	65.91	13	4.43	54	67.01	175	29.395	99	75.61	104
29.2	56.566	165	36.29	183	25.318	49	66.04	10	3.89	43	65.26	215	29.296	69	74.57	125
June 8.1	56.401	125	34.46	219	25.269	17	66.14	4	3.46	30	63.11	247	29.227	39	73.32	143
18.1	56.276	80	32.27	246	25.252	17	66.18	3	3.16	17	60.64	272	29.188	7	71.89	158
28.1	56.196	34	29.81	268	25.269	53	66.21	4	2.99	1	57.92	292	29.181	26	70.31	168
July 8.0	56.162	14	27.13	281	25.322	83	66.17	8	2.98	12	55.00	305	29.207	58	68.63	172
18.0	56.176	62	24.32	286	25.405	114	66.09	15	3.10	26	51.95	309	29.265	90	66.91	170
28.0	56.238	110	21.46	282	25.519	146	65.94	24	3.36	41	48.86	309	29.355	121	65.21	161
Aug. 7.0	56.348	158	18.64	266	25.665	174	65.70	30	3.77	53	45.77	300	29.476	151	63.60	149
16.9	56.506	205	15.98	244	25.839	202	65.40	43	4.30	65	42.77	287	29.627	179	62.11	126
26.9	56.711	248	13.54	209	26.041	226	64.97	56	4.95	76	39.90	268	29.806	207	60.85	101
Sept. 5.9	56.959	289	11.45	167	26.267	251	64.41	68	5.71	85	37.22	244	30.013	231	59.84	66
15.9	57.248	323	9.78	116	26.518	273	63.73	81	6.56	95	34.78	214	30.244	257	59.18	29
25.8	57.571	355	8.62	60	26.791	290	62.92	98	7.51	101	32.64	180	30.501	276	58.89	11
Oct. 5.8	57.926	377	8.02	1	27.081	310	61.94	108	8.52	107	30.84	142	30.777	294	59.00	55
15.8	58.303	391	8.03	63	27.391	322	60.86	120	9.59	110	29.42	99	31.071	308	59.55	98
25.7	58.694	397	8.66	125	27.713	331	59.66	124	10.69	111	28.43	54	31.379	314	60.53	138
Nov. 4.7	59.091	391	9.91	184	28.044	331	58.42	130	11.80	111	27.89	6	31.693	316	61.91	176
14.7	59.482	374	11.75	239	28.375	328	57.12	130	12.91	107	27.83	44	32.009	307	63.67	209
24.7	59.856	344	14.14	284	28.703	312	55.82	123	13.98	101	28.27	93	32.316	293	65.76	234
Dec. 4.6	60.200	305	16.98	321	29.015	292	54.59	114	14.99	92	29.20	140	32.609	268	68.10	251
14.6	60.505	255	20.19	349	29.307	258	53.45	102	15.91	78	30.60	184	32.877	237	70.61	261
24.6	60.760	197	23.68	364	29.565	222	52.43	83	16.69	65	32.44	220	33.114	195	73.22	262
34.6	60.957		27.32		29.787		51.60		17.34		34.64		33.309		75.84	
ean Place	56.697		19.21		23.797		67.45		1.463		53.87		28.314		63.85	
c δ, Tan δ	1.469		−1.076		1.050		+0.323		4.138		+4.015		1.038		−0.278	
α, $D_\omega \alpha$	+0.04		−0.04		+0.07		+0.01		+0.15		+0.14		+0.05		−0.01	
δ, $D_\omega \delta$	−0.2		+0.9		−0.2		+0.8		−0.2		+0.8		−0.2		+0.8	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Cancri. Mag. 3.8				31 Lyncis. Mag. 4.4				d^1 Cancri. Mag. 5.9				ε Argus. Mag. 1.7		
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declin tion
	h m 8 11		° ′ + 9 26		h m 8 17		° ′ +43 27		h m 8 18		° ′ +18 35		h m 8 20		° −59
	s		″		s		″		s		″		s		″
Jan. 0.6	59.822	190	41.79	124	8.519	253	25.48	78	35.655	206	66.99	71	49.850	189	11.58
10.5	60.012	141	40.55	106	8.772	190	26.26	101	35.861	157	66.28	51	50.039	103	15.41
20.5	60.153	90	39.49	87	8.962	124	27.27	123	36.018	103	65.77	31	50.142	16	19.30
30.5	60.243	39	38.62	65	9.086	53	28.50	135	36.121	49	65.46	12	50.158	67	23.12
Feb. 9.5	60.282	11	37.97	48	9.139	13	29.85	141	36.170	3	65.34	5	50.091	148	26.78
19.4	60.271	56	37.49	30	9.126	74	31.26	141	36.167	49	65.39	18	49.943	218	30.19
29.4	60.215	93	37.19	15	9.052	128	32.67	132	36.118	91	65.57	28	49.725	279	33.28
Mar. 10.4	60.122	123	37.04	3	8.924	169	33.99	117	36.027	123	65.85	33	49.446	328	35.98
20.4	59.999	143	37.01	9	8.755	199	35.16	97	35.904	144	66.18	36	49.118	363	38.25
30.3	59.856	153	37.10	17	8.556	217	36.13	72	35.760	156	66.54	36	48.755	385	40.04
Apr. 9.3	59.703	153	37.27	24	8.339	220	36.85	45	35.604	159	66.90	33	48.370	395	41.34
19.3	59.550	146	37.51	29	8.119	211	37.30	15	35.445	151	67.23	30	47.975	392	42.12
29.2	59.404	130	37.80	33	7.908	194	37.45	14	35.294	137	67.53	28	47.583	377	42.37
May 9.2	59.274	107	38.13	37	7.714	164	37.31	40	35.157	114	67.76	19	47.206	352	42.10
19.2	59.167	83	38.50	40	7.550	130	36.91	69	35.043	88	67.95	14	46.854	319	41.32
29.2	59.084	52	38.90	43	7.420	92	36.22	91	34.955	58	68.09	8	46.535	276	40.06
June 8.1	59.032	20	39.33	44	7.328	48	35.31	112	34.897	26	68.17	3	46.259	228	38.34
18.1	59.012	11	39.77	44	7.280	3	34.19	130	34.871	8	68.20	3	46.031	173	36.22
28.1	59.023	43	40.21	43	7.277	42	32.89	144	34.879	41	68.17	9	45.858	113	33.76
July 8.1	59.066	75	40.64	39	7.319	86	31.45	156	34.920	74	68.08	14	45.745	48	31.03
18.0	59.141	105	41.03	34	7.405	129	29.89	166	34.994	105	67.94	23	45.697	16	28.10
28.0	59.246	134	41.37	25	7.534	169	28.23	171	35.099	135	67.71	29	45.713	83	25.07
Aug. 7.0	59.380	162	41.62	15	7.703	208	26.52	174	35.234	164	67.42	39	45.796	152	22.04
16.9	59.542	188	41.77	2	7.911	245	24.78	176	35.398	191	67.03	51	45.948	217	19.11
26.9	59.730	214	41.79	17	8.156	279	23.02	174	35.589	219	66.52	62	46.165	281	16.36
Sept. 5.9	59.944	236	41.62	35	8.435	311	21.28	172	35.808	242	65.90	77	46.446	340	13.94
15.9	60.180	259	41.27	55	8.746	340	19.56	164	36.050	266	65.13	90	46.786	392	11.91
25.8	60.439	278	40.72	77	9.086	365	17.92	158	36.316	287	64.23	102	47.178	436	10.38
Oct. 5.8	60.717	296	39.95	98	9.451	387	16.34	145	36.603	306	63.21	116	47.614	470	9.42
15.8	61.013	310	38.97	118	9.838	407	14.89	130	36.909	320	62.05	126	48.084	492	9.08
25.8	61.323	318	37.79	135	10.245	417	13.59	110	37.229	330	60.79	132	48.576	501	9.38
Nov. 4.7	61.641	321	36.44	147	10.662	421	12.49	88	37.559	336	59.47	136	49.077	492	10.36
14.7	61.962	317	34.97	155	11.083	416	11.61	62	37.895	331	58.11	135	49.569	471	11.97
24.7	62.279	303	33.42	158	11.499	399	10.99	32	38.226	321	56.76	127	50.040	433	14.18
Dec. 4.6	62.582	283	31.84	155	11.898	373	10.67	3	38.547	298	55.49	118	50.473	379	16.92
14.6	62.865	252	30.29	146	12.271	334	10.64	29	38.845	269	54.31	103	50.852	316	20.11
24.6	63.117	214	28.83	135	12.605	284	10.93	60	39.114	230	53.28	83	51.168	239	23.64
34.6	63.331		27.48		12.889		11.53		39.344		52.45		51.407		27.38
Mean Place	57.660		42.90		5.535		31.09		33.377		69.73		47.481		20.02
Sec δ, Tan δ	1.014		+0.166		1.378		+0.948		1.055		+0.337		1.955		−1.68
Dψ α, Dω α	+0.06		+0.01		+0.08		+0.04		+0.07		+0.01		+0.02		−0.06
Dψ δ, Dω δ	*−0.2*		+0.8		−0.2		+0.8		−0.2		+0.8		−0.2		+0.8

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	**30 Monocerotis.** Mag. 4.0				**θ Chamæleontis.** Mag. 4.3				**ο Ursæ Majoris.** Mag. 3.5				**Groombridge 1450.** Mag. 6.0			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 8 21		° ′ − 3 37		h m 8 23		° ′ −77 12		h m 8 23		° ′ +60 59		h m 8 27		° ′ +38 17	
	s		″		s		″		s		″		s		″	
Jan. 0.6	29.879	186	53.27	201	14.97	28	40.53	378	22.14	35	53.06	166	30.374	250	73.48	40
10.5	30.065	141	55.28	186	15.25	9	44.31	389	22.49	26	54.72	193	30.624	192	73.88	67
20.5	30.206	90	57.14	168	15.34	— 11	48.20	389	22.75	16	56.65	213	30.816	130	74.55	89
30.5	30.296	39	58.82	147	15.23	29	52.09	377	22.91	5	58.78	223	30.946	66	75.44	105
Feb. 9.5	30.335	— 8	60.29	122	14.94	45	55.86	356	22.96	— 3	61.01	223	31.012	2	76.49	117
19.4	30.327	53	61.51	100	14.49	61	59.42	329	22.93	13	63.24	213	31.014	— 55	77.66	120
29.4	30.274	90	62.51	76	13.88	74	62.71	294	22.80	20	65.37	195	30.959	106	78.86	116
Mar. 10.4	30.184	120	63.27	54	13.14	84	65.65	252	22.60	27	67.32	167	30.853	146	80.02	108
20.4	30.064	139	63.81	30	12.30	93	68.17	207	22.33	31	68.99	132	30.707	176	81.10	93
30.3	29.925	152	64.11	11	11.37	98	70.24	159	22.02	35	70.31	94	30.531	192	82.03	73
Apr. 9.3	29.773	153	64.22	— 8	10.39	101	71.83	107	21.67	36	71.25	51	30.339	198	82.76	51
19.3	29.620	147	64.14	27	9.38	102	72.90	53	21.31	35	71.76	6	30.141	193	83.27	27
29.2	29.473	134	63.87	43	8.36	100	73.43	— 1	20.96	33	71.82	— 37	29.948	177	83.54	4
May 9.2	29.339	113	63.44	59	7.36	95	73.42	53	20.63	29	71.45	80	29.771	152	83.58	— 22
19.2	29.226	91	62.85	74	6.41	89	72.89	103	20.34	24	70.65	119	29.619	122	83.36	45
29.2	29.135	63	62.11	86	5.52	81	71.86	152	20.10	19	69.46	153	29.497	87	82.91	66
June 8.1	29.072	34	61.25	96	4.71	70	70.34	197	19.91	13	67.93	184	29.410	50	82.25	85
18.1	29.038	4	60.29	104	4.01	57	68.37	234	19.78	6	66.09	210	29.360	9	81.40	101
28.1	29.034	— 27	59.25	108	3.44	44	66.03	267	19.72	— 2	63.99	228	29.351	— 32	80.39	118
July 8.1	29.061	58	58.17	109	3.00	28	63.36	290	19.74	8	61.71	245	29.383	71	79.21	128
18.0	29.119	87	57.08	106	2.72	12	60.46	306	19.82	14	59.26	253	29.454	110	77.93	140
28.0	29.206	116	56.02	98	2.60	— 4	57.40	311	19.96	21	56.73	260	29.564	148	76.53	146
Aug. 7.0	29.322	144	55.04	85	2.64	21	54.29	304	20.17	27	54.13	257	29.712	182	75.07	153
16.9	29.466	172	54.19	67	2.85	38	51.25	290	20.44	32	51.56	254	29.894	217	73.54	158
26.9	29.638	197	53.52	46	3.23	54	48.35	263	20.76	38	49.02	244	30.111	249	71.96	161
Sept. 5.9	29.835	224	53.06	18	3.77	68	45.72	225	21.14	44	46.58	230	30.360	279	70.35	161
15.9	30.059	245	52.88	— 12	4.45	81	43.47	179	21.58	48	44.28	212	30.639	309	68.74	161
25.8	30.304	269	53.00	42	5.26	91	41.68	124	22.06	52	42.16	190	30.948	333	67.13	157
Oct. 5.8	30.573	286	53.42	76	6.17	99	40.44	63	22.58	55	40.26	163	31.281	358	65.56	151
15.8	30.859	302	54.18	109	7.16	103	39.81	— 3	23.13	57	38.63	132	31.639	375	64.05	141
25.8	31.161	311	55.27	138	8.19	104	39.84	68	23.70	59	37.31	98	32.014	389	62.64	128
Nov. 4.7	31.472	314	56.65	166	9.23	101	40.52	136	24.29	59	36.33	59	32.403	395	61.36	109
14.7	31.786	312	58.31	187	10.24	95	41.88	196	24.88	59	35.74	19	32.798	393	60.27	88
24.7	32.098	298	60.18	201	11.19	84	43.84	253	25.47	56	35.55	— 25	33.191	380	59.39	63
Dec. 4.6	32.396	280	62.19	212	12.03	72	46.37	302	26.03	51	35.80	66	33.571	357	58.76	35
14.6	32.676	248	64.31	211	12.75	56	49.39	340	26.54	46	36.46	108	33.928	323	58.41	7
24.6	32.924	211	66.42	207	13.31	39	52.79	367	27.00	40	37.54	144	34.251	278	58.34	— 24
34.6	33.135		68.49		13.70		56.46		27.40		38.98		34.529		58.58	
Mean Place	27.868		53.80		10.871		50.51		17.919		60.62		27.627		79.40	
Sec δ, Tan δ	1.002		−0.063		4.519		−4.407		2.063		+1.804		1.274		+0.790	
$D_\psi \alpha$, $D_\omega \alpha$	+0.06		0.00		−0.03		−0.17		+0.10		+0.07		+0.08		+0.03	
$D_\psi \delta$, $D_\omega \delta$	−0.2		+0.8		−0.2		+0.8		−0.2		+0.8		−0.2		+0.8	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	η Cancri. Mag. 5.5				Groombridge 1446. Mag. 6.3				δ Hydræ. Mag. 4.2				σ Hydræ. Mag. 4.5			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 8 27		° ′ +20 43		h m 8 30		° ′ +73 55		h m 8 33		° ′ + 5 59		h m 8 34		° ′ + 3 37	
	s		″		s		″		s		″		s		″	
Jan. 0.6	53.528		34.63		30.80		20.02		14.706		49.25		24.141		72.59	
10.6	53.746	218	34.01	62	31.36	56	22.18	216	14.912	206	47.73	152	24.345	204	70.95	164
20.5	53.913	167	33.60	41	31.77	41	24.63	245	15.071	159	46.41	132	24.503	158	69.49	146
30.5	54.028	115	33.41	19	32.02	25	27.28	265	15.179	108	45.28	113	24.612	109	68.20	129
Feb. 9.5	54.088	60	33.40	1	32.09	7	30.01	273	15.237	58	44.37	91	24.669	57	67.15	105
19.4	54.094	6	33.57	17	32.00	9	32.71	270	15.245	8	43.67	70	24.677	8	66.29	86
29.4	54.052	42	33.88	31	31.75	25	35.26	255	15.206	39	43.16	51	24.639	38	65.68	61
Mar. 10.4	53.967	85	34.27	39	31.37	38	37.58	232	15.129	77	42.85	31	24.564	75	65.22	46
20.4	53.849	118	34.71	44	30.88	49	39.54	196	15.019	110	42.70	15	24.455	109	64.97	25
30.3	53.708	141	35.16	45	30.29	59	41.07	153	14.889	130	42.70	0	24.325	130	64.88	9
Apr. 9.3	53.552	156	35.59	43	29.65	64	42.13	106	14.744	145	42.81	11	24.184	141	64.94	6
19.3	53.393	159	35.97	38	28.98	67	42.68	55	14.596	148	43.02	21	24.037	147	65.11	17
29.3	53.239	154	36.30	33	28.31	67	42.69	1	14.453	143	43.32	30	23.893	144	65.41	30
May 9.2	53.099	140	36.54	24	27.68	63	42.18	51	14.320	133	43.69	37	23.761	132	65.79	38
19.2	52.980	119	36.71	17	27.09	59	41.17	101	14.207	113	44.13	44	23.646	115	66.27	48
29.2	52.886	94	36.81	10	26.58	51	39.69	148	14.116	91	44.62	49	23.553	93	66.82	55
June 8.1	52.822	64	36.82	1	26.16	42	37.80	189	14.052	64	45.16	54	23.488	65	67.41	59
18.1	52.789	33	36.76	6	25.86	30	35.53	227	14.014	38	45.72	56	23.450	38	68.07	66
28.1	52.788	1	36.63	13	25.66	20	32.97	256	14.009	5	46.29	57	23.439	11	68.75	68
July 8.1	52.822	34	36.42	21	25.58	8	30.16	281	14.032	23	46.86	57	23.462	23	69.43	68
18.0	52.887	65	36.14	28	25.62	4	27.20	296	14.085	53	47.40	54	23.511	49	70.10	67
28.0	52.984	97	35.77	37	25.79	17	24.12	308	14.167	82	47.88	48	23.592	81	70.74	64
Aug. 7.0	53.112	128	35.33	44	26.07	28	21.02	310	14.278	111	48.29	41	23.699	107	71.26	52
17.0	53.270	158	34.78	55	26.47	40	17.94	308	14.417	139	48.58	29	23.836	137	71.68	42
26.9	53.454	184	34.11	67	26.97	50	14.95	299	14.584	167	48.72	14	23.999	163	71.95	27
Sept. 5.9	53.667	213	33.34	77	27.58	61	12.09	286	14.776	192	48.67	5	24.192	193	72.01	6
15.9	53.905	238	32.45	89	28.27	69	9.44	265	14.995	219	48.42	25	24.409	217	71.86	15
25.8	54.168	263	31.43	102	29.04	77	7.03	241	15.237	242	47.92	50	24.647	238	71.45	41
Oct. 5.8	54.453	285	30.28	115	29.90	86	4.94	209	15.502	265	47.20	72	24.911	264	70.80	65
15.8	54.760	307	29.03	125	30.80	90	3.20	174	15.789	287	46.21	99	25.195	284	69.87	93
25.8	55.082	322	27.71	132	31.74	94	1.86	134	16.091	302	45.01	120	25.496	301	68.69	118
Nov. 4.7	55.416	334	26.33	138	32.71	97	0.96	90	16.406	315	43.58	143	25.810	314	67.27	142
14.7	55.756	340	24.94	139	33.70	99	0.52	44	16.726	320	42.00	158	26.129	319	65.66	161
24.7	56.096	340	23.59	135	34.65	95	0.58	6	17.047	321	40.30	170	26.448	319	63.91	175
Dec. 4.7	56.424	328	22.32	127	35.57	92	1.14	56	17.357	310	38.53	177	26.758	310	62.07	184
14.6	56.733	309	21.20	112	36.42	85	2.19	105	17.649	292	36.76	177	27.047	289	60.21	186
24.6	57.013	280	20.23	97	37.18	76	3.71	152	17.915	266	35.05	171	27.312	265	58.38	183
34.6	57.254	241	19.47	76	37.80	62	5.65	194	18.142	227	33.45	160	27.539	227	56.66	172
Mean Place	51.235		38.24		23.950		28.86		12.642		50.75		22.106		73.72	
Sec δ, Tan δ	1.069		+0.378		3.611		+3.470		1.005		+0.105		1.002		+0.064	
$D_\psi \alpha$, $D_\omega \alpha$	+0.07		+0.02		+0.13		+0.14		+0.06		0.00		+0.06		0.00	
$D_\psi \delta$, $D_\omega \delta$	−0.2		+0.8		−0.2		+0.8		−0.2		+0.8		−0.2		+0.8	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Cancri. Mag. 4.7				δ Cancri. Mag. 4.2				α Pyxidis. Mag. 3.7				ι Cancri. Mag. 4.2			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	8 38		+21 45		8 39		+18 27		8 40		−32 52		8 41		+29 3	
	s		″		s		″		s		″		s		″	
Jan. 0.6	27.956		72.59		57.058		45.64		14.855		53.49		39.525		58.89	
10.6	28.185	229	71.97	62	57.283	225	44.81	83	15.053	198	56.78	329	39.769	244	58.68	21
20.5	28.364	179	71.58	39	57.460	177	44.22	59	15.199	146	60.06	328	39.962	193	58.73	5
30.5	28.490	126	71.42	16	57.586	126	43.84	38	15.287	88	63.24	318	40.097	135	59.02	29
Feb. 9.5	28.561	71	71.47	5	57.657	71	43.68	16	15.319	32	66.23	299	40.176	79	59.51	49
19.4	28.580	19	71.71	24	57.675	18	43.71	3	15.297	22	68.98	275	40.197	21	60.17	66
29.4	28.549	31	72.07	36	57.644	31	43.89	18	15.225	72	71.43	245	40.164	33	60.94	77
Mar. 10.4	28.471	78	72.52	45	57.571	73	44.18	29	15.109	116	73.54	211	40.085	79	61.75	81
20.4	28.359	112	73.03	51	57.462	109	44.56	38	14.960	149	75.28	174	39.968	117	62.57	82
30.3	28.222	137	73.55	52	57.330	132	44.97	41	14.784	176	76.62	134	39.823	145	63.33	76
Apr. 9.3	28.070	152	74.05	50	57.182	148	45.39	42	14.593	191	77.57	95	39.659	164	63.99	66
19.3	27.912	158	74.50	45	57.029	153	45.79	40	14.396	197	78.10	53	39.490	169	64.53	54
29.3	27.758	154	74.87	37	56.878	151	46.15	36	14.199	197	78.22	12	39.324	166	64.93	40
May 9.2	27.615	143	75.15	28	56.739	139	46.45	30	14.012	187	77.93	29	39.169	155	65.16	23
19.2	27.491	124	75.33	18	56.619	120	46.69	24	13.842	170	77.24	69	39.034	135	65.23	7
29.2	27.391	100	75.43	10	56.522	97	46.87	18	13.692	150	76.19	105	38.924	110	65.14	9
June 8.1	27.319	72	75.43	0	56.452	70	46.99	12	13.569	123	74.80	139	38.843	81	64.89	25
18.1	27.277	42	75.34	9	56.410	42	47.03	4	13.476	93	73.11	169	38.794	49	64.49	40
28.1	27.268	9	75.17	17	56.401	9	47.01	2	13.414	62	71.16	195	38.779	15	63.96	53
July 8.1	27.291	23	74.89	28	56.423	22	46.92	9	13.387	27	69.01	215	38.798	19	63.30	66
18.0	27.346	55	74.54	35	56.475	52	46.75	17	13.394	7	66.73	228	38.851	53	62.53	77
28.0	27.432	86	74.09	45	56.559	84	46.48	27	13.437	43	64.38	235	38.939	88	61.66	87
Aug. 7.0	27.550	118	73.55	54	56.673	114	46.13	35	13.517	80	62.05	233	39.060	121	60.68	98
17.0	27.697	147	72.90	65	56.815	142	45.67	46	13.634	117	59.83	222	39.212	152	59.61	107
26.9	27.874	177	72.14	76	56.986	171	45.09	58	13.788	154	57.80	203	39.395	183	58.43	118
Sept. 5.9	28.078	204	71.27	87	57.185	199	44.37	72	13.977	189	56.04	176	39.608	213	57.18	125
15.9	28.309	231	70.28	99	57.410	225	43.51	86	14.201	224	54.62	142	39.849	241	55.84	134
25.8	28.567	258	69.16	112	57.661	251	42.50	101	14.458	257	53.64	98	40.118	269	54.44	140
Oct. 5.8	28.847	280	67.93	123	57.935	274	41.35	115	14.744	286	53.13	51	40.413	295	52.98	146
15.8	29.150	303	66.60	133	58.233	298	40.07	128	15.056	312	53.17	4	40.730	317	51.49	149
25.8	29.470	320	65.20	140	58.547	314	38.69	138	15.387	331	53.74	57	41.069	339	50.00	149
Nov. 4.7	29.805	335	63.76	144	58.876	329	37.23	146	15.732	345	54.85	111	41.422	353	48.54	146
14.7	30.148	343	62.32	144	59.213	337	35.73	150	16.081	349	56.49	164	41.784	362	47.17	137
24.7	30.491	343	60.92	140	59.551	338	34.25	148	16.427	346	58.62	213	42.146	362	45.92	125
Dec. 4.7	30.826	335	59.62	130	59.880	329	32.83	142	16.757	330	61.15	253	42.500	354	44.84	108
14.6	31.142	316	58.48	114	60.191	311	31.52	131	17.062	305	64.01	286	42.836	336	43.97	87
24.6	31.432	290	57.49	99	60.477	286	30.38	114	17.334	272	67.13	312	43.142	306	43.34	63
34.6	31.683	251	56.68	81	60.725	248	29.43	95	17.561	227	70.38	325	43.411	269	42.96	38
Mean Place	25.678		76.99		54.842		49.59		12.973		58.79		37.098		64.64	
Sec δ, Tan δ	1.077		+0.399		1.054		+0.334		1.191		−0.647		1.144		+0.556	
$D_\psi \alpha$, $D_\omega \alpha$	+0.07		+0.02		+0.07		+0.01		+0.05		−0.03		+0.07		+0.02	
$D_\psi \delta$, $D_\omega \delta$	−0.3		+0.8		−0.3		+0.8		−0.3		+0.8		−0.3		+0.8	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ε Hydræ. Mag. 3.5				δ Argus. Mag. 2.0				σ² Cancri (*mean*). Mag. 5.5				ζ Hydræ. Mag. 3.3			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 8 42		° ′ + 6 43		h m 8 42		° ′ −54 23		h m 8 49		° ′ +30 53		h m 8 50		° ′ + 6 15	
	s		″		s		″		s		″		s		″	
Jan. 0.6	21.804		38.05		24.956		52.76		9.867		47.45		59.342		55.13	
		213		150		220		375		254		14		221		155
10.6	22.017		36.55		25.176		56.51		10.121		47.31		59.563		53.58	
		168		132		146		383		203		13		176		137
20.5	22.185		35.23		25.322		60.34		10.324		47.44		59.739		52.21	
		119		111		70		380		147		38		126		115
30.5	22.304		34.12		25.392		64.14		10.471		47.82		59.865		51.06	
		67		90		8		368		87		59		76		94
Feb. 9.5	22.371		33.22		25.384		67.82		10.558		48.41		59.941		50.12	
		17		67		79		345		30		77		25		71
19.5	22.388		32.55		25.305		71.27		10.588		49.18		59.966		49.41	
		29		47		146		317		25		86		22		51
29.4	22.359		32.08		25.159		74.44		10.563		50.04		59.944		48.90	
		70		28		203		282		74		93		63		31
Mar. 10.4	22.289		31.80		24.956		77.26		10.489		50.97		59.881		48.59	
		101		13		250		240		113		91		95		14
20.4	22.188		31.67		24.706		79.66		10.376		51.88		59.786		48.45	
		127		1		286		195		143		86		122		0
30.3	22.061		31.68		24.420		81.61		10.233		52.74		59.664		48.45	
		140		14		311		148		163		74		136		12
Apr. 9.3	21.921		31.82		24.109		83.09		10.070		53.48		59.528		48.57	
		146		24		323		99		171		62		143		24
19.3	21.775		32.06		23.786		84.08		9.899		54.10		59.385		48.81	
		144		31		325		46		170		45		142		31
29.3	21.631		32.37		23.461		84.54		9.729		54.55		59.243		49.12	
		133		37		316		4		159		26		133		38
May 9.2	21.498		32.74		23.145		84.50		9.570		54.81		59.110		49.50	
		116		43		299		53		141		9		117		44
19.2	21.382		33.17		22.846		83.97		9.429		54.90		58.993		49.94	
		95		47		274		103		117		11		97		48
29.2	21.287		33.64		22.572		82.94		9.312		54.79		58.896		50.42	
		69		50		240		147		89		29		73		51
June 8.2	21.218		34.14		22.332		81.47		9.223		54.50		58.823		50.93	
		43		53		203		188		57		44		48		54
18.1	21.175		34.67		22.129		79.59		9.166		54.06		58.775		51.47	
		13		53		157		224		23		61		19		54
28.1	21.162		35.20		21.972		77.35		9.143		53.45		58.756		52.01	
		16		51		109		255		12		74		8		53
July 8.1	21.178		35.71		21.863		74.80		9.155		52.71		58.764		52.54	
		46		49		57		274		46		87		38		50
18.0	21.224		36.20		21.806		72.06		9.201		51.84		58.802		53.04	
		75		42		1		289		81		99		67		43
28.0	21.299		36.62		21.805		69.17		9.282		50.85		58.869		53.47	
		102		34		56		293		114		111		93		35
Aug. 7.0	21.401		36.96		21.861		66.24		9.396		49.74		58.962		53.82	
		132		21		112		287		145		121		123		22
17.0	21.533		37.17		21.973		63.37		9.541		48.53		59.085		54.04	
		159		7		171		270		178		130		151		9
26.9	21.692		37.24		22.144		60.67		9.719		47.23		59.236		54.13	
		185		10		229		244		209		138		177		11
Sept. 5.9	21.877		37.14		22.373		58.23		9.928		45.85		59.413		54.02	
		212		32		282		207		238		146		205		32
15.9	22.089		36.82		22.655		56.16		10.166		44.39		59.618		53.70	
		236		54		334		160		268		152		229		53
25.9	22.325		36.28		22.989		54.56		10.434		42.87		59.847		53.17	
		261		79		376		108		294		156		256		79
Oct. 5.8	22.586		35.49		23.365		53.48		10.728		41.31		60.103		52.38	
		282		101		412		48		319		158		277		103
15.8	22.868		34.48		23.777		53.00		11.047		39.73		60.380		51.35	
		301		125		439		14		340		156		299		126
25.8	23.169		33.23		24.216		53.14		11.387		38.17		60.679		50.09	
		313		144		454		80		357		152		313		146
Nov. 4.7	23.482		31.79		24.670		53.94		11.744		36.65		60.992		48.63	
		321		161		456		144		367		141		322		164
14.7	23.803		30.18		25.126		55.38		12.111		35.24		61.314		46.99	
		323		172		443		203		369		127		324		175
24.7	24.126		28.46		25.569		57.41		12.480		33.97		61.638		45.24	
		314		178		419		257		361		108		318		182
Dec. 4.7	24.440		26.68		25.988		59.98		12.841		32.89		61.956		43.42	
		297		177		379		304		345		86		302		181
14.6	24.737		24.91		26.367		63.02		13.186		32.03		62.258		41.61	
		271		171		325		340		316		59		277		176
24.6	25.008		23.20		26.692		66.42		13.502		31.44		62.535		39.85	
		237		159		263		364		279		31		243		165
34.6	25.245		21.61		26.955		70.06		13.781		31.13		62.778		38.20	
Mean Place	19.761		40.04		22.850		61.33		7.423		54.01		57.329		57.40	
Sec δ, Tan δ	1.007		+0.118		1.718		−1.397		1.166		+0.598		1.006		+0.110	
$D_\psi \alpha$, $D_\omega \alpha$	+0.06		+0.01		+0.03		−0.06		+0.07		+0.03		+0.06		0.00	
$D_\psi \delta$, $D_\omega \delta$	−0.3		+0.8		−0.3		+0.8		−0.3		+0.7		−0.3		+0.7	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ι Ursæ Majoris. Mag. 3.1				α Cancri. Mag. 4.3				b¹ Carinæ. Mag. 5.1				κ Ursæ Majoris. Mag. 3.7			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	8 53		+48 21		8 53		+12 10		8 54		−58 54		8 57		+47 28	
	s		″		s		″		s		″		s		″	
Jan. 0.6	30.912		70.93		55.784		57.20		57.177		8.27		56.897		72.81	
10.6	31.225	313	71.72	79	56.013	229	55.97	123	57.431	254	12.03	376	57.211	314	73.52	71
20.5	31.474	249	72.84	112	56.197	184	54.94	103	57.604	173	15.90	387	57.464	253	74.57	105
30.5	31.651	177	74.22	138	56.332	135	54.14	80	57.693	89	19.79	389	57.647	183	75.89	132
Feb. 9.5	31.754	103	75.81	159	56.414	82	53.56	58	57.696	3	23.59	380	57.757	110	77.43	154
19.5	31.785	31	77.52	171	56.444	30	53.20	36	57.619	77	27.21	362	57.794	37	79.11	168
29.4	31.744	41	79.27	175	56.427	17	53.03	17	57.466	153	30.56	335	57.762	32	80.83	172
Mar. 10.4	31.641	103	80.96	169	56.367	60	53.03	0	57.249	217	33.58	302	57.667	95	82.51	168
20.4	31.485	156	82.52	156	56.273	94	53.15	12	56.980	269	36.21	263	57.521	146	84.09	158
30.4	31.290	195	83.89	137	56.152	121	53.39	24	56.663	317	38.41	220	57.334	187	85.47	138
Apr. 9.3	31.066	224	84.99	110	56.016	136	53.68	29	56.316	347	40.12	171	57.119	215	86.60	113
19.3	30.829	237	85.78	79	55.871	145	54.02	34	55.952	364	41.36	124	56.890	229	87.44	84
29.3	30.591	238	86.26	48	55.728	143	54.39	37	55.583	369	42.06	70	56.659	231	87.96	52
May 9.2	30.363	228	86.38	12	55.593	135	54.77	38	55.217	366	42.25	19	56.437	222	88.14	18
19.2	30.157	206	86.16	22	55.475	118	55.15	38	54.866	351	41.93	32	56.235	202	87.98	16
29.2	29.981	176	85.60	56	55.376	99	55.50	35	54.539	327	41.10	83	56.061	174	87.50	48
June 8.2	29.839	142	84.74	86	55.301	75	55.84	34	54.244	295	39.78	132	55.921	140	86.70	80
18.1	29.738	101	83.58	116	55.252	49	56.16	32	53.989	255	38.04	174	55.820	101	85.60	110
28.1	29.681	57	82.17	141	55.232	20	56.43	27	53.781	208	35.90	214	55.761	59	84.26	134
July 8.1	29.669	12	80.54	163	55.240	8	56.65	22	53.625	156	33.43	247	55.746	15	82.69	157
18.1	29.702	33	78.73	181	55.278	38	56.82	17	53.526	99	30.71	272	55.775	29	80.94	175
28.0	29.781	79	76.77	196	55.346	68	56.91	9	53.489	37	27.80	291	55.848	73	79.02	192
Aug. 7.0	29.905	124	74.68	209	55.441	95	56.90	1	53.516	27	24.83	297	55.966	118	76.99	203
17.0	30.073	168	72.52	216	55.565	124	56.78	12	53.609	93	21.88	295	56.126	160	74.85	214
26.9	30.282	209	70.32	220	55.717	152	56.51	27	53.770	161	19.06	282	56.327	201	72.67	218
Sept. 5.9	30.533	251	68.10	222	55.896	179	56.08	43	53.996	226	16.47	259	56.569	242	70.47	220
15.9	30.822	289	65.90	220	56.103	207	55.46	62	54.288	292	14.21	226	56.849	280	68.27	220
25.9	31.148	326	63.77	213	56.335	232	54.66	80	54.638	350	12.40	181	57.167	318	66.12	215
Oct. 5.8	31.509	361	61.72	205	56.594	259	53.67	99	55.042	404	11.09	131	57.519	352	64.06	206
15.8	31.902	393	59.81	191	56.875	281	52.47	120	55.489	447	10.39	70	57.904	385	62.12	194
25.8	32.320	418	58.09	172	57.178	303	51.11	136	55.969	480	10.31	8	58.315	411	60.35	177
Nov. 4.8	32.760	440	56.58	151	57.496	318	49.59	152	56.469	500	10.89	58	58.746	431	58.80	155
14.7	33.212	452	55.36	122	57.824	328	47.97	162	56.975	506	12.12	123	59.193	447	57.51	129
24.7	33.666	454	54.44	92	58.155	331	46.30	167	57.469	494	13.97	185	59.643	450	56.53	98
Dec. 4.7	34.111	445	53.88	56	58.480	325	44.63	167	57.938	469	16.38	241	60.084	441	55.89	64
14.6	34.536	425	53.69	19	58.789	309	43.02	161	58.365	427	19.31	293	60.507	423	55.62	27
24.6	34.925	389	53.88	19	59.075	286	41.51	151	58.734	369	22.63	332	60.896	389	55.74	12
34.6	35.268	343	54.45	57	59.327	252	40.16	135	59.037	303	26.24	361	61.240	344	56.22	48
Mean Place	27.836		80.25		53.709		60.76		55.031		17.78		53.888		82.42	
Sec δ, Tan δ	1.505		+1.125		1.023		+0.216		1.936		−1.658		1.480		+1.091	
Dψ α, Dω α	+0.08		+0.05		+0.07		+0.01		+0.03		−0.08		+0.08		+0.05	
Dψ δ, Dω δ	−0.3		+0.7		−0.3		+0.7		−0.3		+0.7		−0.3		+0.7	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	σ² Ursæ Majoris. Mag. 4.9				κ Cancri. Mag. 5.1				λ Argus. Mag. 2.2				θ Hydræ. Mag. 3.8			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	9 3		+67 28		9 3		+11 0		9 4		−43 5		9 9		+ 2 39	
	s		″		s		″		s		″		s		″	
Jan. 0.6	6.20	49	24.03	162	13.998	236	21.11	134	56.174	235	27.97	352	61.644	236	67.40	181
10.6	6.69	40	25.65	200	14.234	191	19.77	112	56.409	178	31.49	358	61.880	191	65.59	163
20.6	7.09	28	27.65	228	14.425	142	18.65	90	56.587	115	35.07	357	62.071	143	63.96	144
30.5	7.37	14	29.93	247	14.567	90	17.75	67	56.702	52	38.64	343	62.214	92	62.52	120
Feb. 9.5	7.51	4	32.40	255	14.657	40	17.08	45	56.754	9	42.07	325	62.306	42	61.32	98
19.5	7.55	9	34.95	252	14.697	9	16.63	24	56.745	66	45.32	298	62.348	4	60.34	74
29.4	7.46	19	37.47	239	14.688	51	16.39	7	56.679	116	48.30	264	62.344	46	59.60	53
Mar. 10.4	7.27	30	39.86	214	14.637	87	16.32	8	56.563	158	50.94	228	62.298	81	59.07	33
20.4	6.97	36	42.00	181	14.550	114	16.40	19	56.405	190	53.22	188	62.217	108	58.74	14
30.4	6.61	42	43.81	143	14.436	131	16.59	28	56.215	214	55.10	144	62.109	126	58.60	0
Apr. 9.3	6.19	45	45.24	97	14.305	141	16.87	34	56.001	225	56.54	99	61.983	136	58.60	15
19.3	5.74	46	46.21	49	14.164	141	17.21	38	55.776	231	57.53	54	61.847	137	58.75	27
29.3	5.28	45	46.70	2	14.023	134	17.59	40	55.545	227	58.07	8	61.710	131	59.02	37
May 9.3	4.83	43	46.68	49	13.889	119	17.99	40	55.318	215	58.15	39	61.579	119	59.39	45
19.2	4.40	38	46.19	95	13.770	102	18.39	40	55.103	198	57.76	82	61.460	103	59.84	53
29.2	4.02	32	45.24	140	13.668	79	18.79	38	54.905	174	56.94	124	61.357	82	60.37	58
June 8.2	3.70	26	43.84	180	13.589	55	19.17	36	54.731	146	55.70	161	61.275	58	60.95	63
18.1	3.44	18	42.04	214	13.534	27	19.53	33	54.585	114	54.09	193	61.217	33	61.58	66
28.1	3.26	11	39.90	242	13.507	0	19.86	28	54.471	79	52.16	223	61.184	8	62.24	66
July 8.1	3.15	3	37.48	266	13.507	29	20.14	20	54.392	40	49.93	242	61.176	21	62.90	64
18.1	3.12	5	34.82	284	13.536	58	20.34	14	54.352	2	47.51	257	61.197	47	63.54	59
28.0	3.17	15	31.98	295	13.594	85	20.48	5	54.350	42	44.94	261	61.244	75	64.13	50
Aug. 7.0	3.32	22	29.03	301	13.679	114	20.53	8	54.392	86	42.33	256	61.319	102	64.63	39
17.0	3.54	30	26.02	302	13.793	142	20.45	23	54.478	131	39.77	243	61.421	131	65.02	23
27.0	3.84	37	23.00	296	13.935	170	20.22	39	54.609	174	37.34	219	61.552	159	65.25	5
Sept. 5.9	4.21	44	20.04	285	14.105	198	19.83	58	54.783	219	35.15	188	61.711	186	65.30	19
15.9	4.65	51	17.19	269	14.303	225	19.25	79	55.002	261	33.27	146	61.897	215	65.11	42
25.9	5.16	58	14.50	246	14.528	251	18.46	99	55.263	299	31.81	98	62.112	242	64.69	70
Oct. 5.8	5.74	62	12.04	218	14.779	275	17.47	119	55.562	333	30.83	41	62.354	267	63.99	96
15.8	6.36	67	9.86	187	15.054	298	16.28	137	55.895	361	30.42	15	62.621	290	63.03	124
25.8	7.03	70	7.99	147	15.352	314	14.91	153	56.256	381	30.57	75	62.911	308	61.79	148
Nov. 4.8	7.73	72	6.52	105	15.666	326	13.38	167	56.637	390	31.32	135	63.219	321	60.31	169
14.7	8.45	73	5.47	58	15.992	331	11.71	172	57.027	388	32.67	191	63.540	325	58.62	185
24.7	9.18	71	4.89	10	16.323	326	9.99	174	57.415	376	34.58	241	63.865	322	56.77	195
Dec. 4.7	9.89	68	4.79	41	16.649	312	8.25	170	57.791	351	36.99	284	64.187	309	54.82	200
14.6	10.57	61	5.20	91	16.961	291	6.55	159	58.142	314	39.83	318	64.496	287	52.82	197
24.6	11.18	54	6.11	136	17.252	256	4.96	145	58.456	268	43.01	341	64.783	255	50.85	188
34.6	11.72		7.47		17.508		3.51		58.724		46.42		65.038		48.97	
Mean Place	1.322		35.96		11.972		24.87		54.344		35.32		59.736		69.65	
Sec δ, Tan δ	2.610		+2.411		1.019		+0.194		1.369		−0.936		1.001		+0.047	
Dψ α, Dω α	+0.11		+0.12		+0.06		+0.01		+0.04		−0.04		+0.06		0.00	
Dψ δ, Dω δ	−0.3		+0.7		−0.3		+0.7		−0.3		+0.7		−0.3		+0.7	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Argus. Mag. 1.8 Right Ascension.		β Argus. Declination.		88 Cancri. Mag. 6.6 Right Ascension.		88 Cancri. Declination.		ι Argus. Mag. 2.2 Right Ascension.		ι Argus. Declination.		49 Lyncis. Mag. 3.3 Right Ascension.		49 Lyncis. Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	9 12		−69 22		9 14		+18 3		9 14		−58 55		9 15		+34 44	
	s		″		s		″		s		″		s		″	
Jan. 0.6	19.47	36	4.77	368	19.864	254	37.72	101	52.391	291	10.46	367	58.979	287	45.38	10
10.6	19.83	23	8.45	388	20.118	209	36.71	75	52.682	214	14.13	384	59.266	237	45.28	23
20.6	20.06	13	12.33	396	20.327	158	35.96	50	52.896	130	17.97	389	59.503	180	45.51	51
30.5	20.19	2	16.29	395	20.485	106	35.46	25	53.026	46	21.86	384	59.683	121	46.02	78
Feb. 9.5	20.21	11	20.24	384	20.591	53	35.21	3	53.072	36	25.70	371	59.804	59	46.80	98
19.5	20.10	21	24.08	362	20.644	3	35.18	17	53.036	111	29.41	348	59.863	0	47.78	111
29.4	19.89	31	27.70	336	20.647	43	35.35	31	52.925	180	32.89	318	59.863	52	48.89	120
Mar. 10.4	19.58	39	31.06	300	20.604	81	35.66	42	52.745	239	36.07	282	59.811	96	50.09	118
20.4	19.19	45	34.06	258	20.523	111	36.08	50	52.506	284	38.89	241	59.715	133	51.27	113
30.4	18.74	51	36.64	215	20.412	131	36.58	52	52.222	321	41.30	196	59.582	158	52.40	101
Apr. 9.3	18.23	55	38.79	165	20.281	141	37.10	52	51.901	343	43.26	147	59.424	171	53.41	85
19.3	17.68	56	40.44	113	20.140	145	37.62	48	51.558	357	44.73	97	59.253	176	54.26	64
29.3	17.12	57	41.57	61	19.995	138	38.10	44	51.201	358	45.70	44	59.077	170	54.90	43
May 9.3	16.55	57	42.18	6	19.857	126	38.54	36	50.843	348	46.14	7	58.907	157	55.33	19
19.2	15.98	53	42.24	48	19.731	110	38.90	28	50.495	331	46.07	57	58.750	138	55.52	4
29.2	15.45	50	41.76	99	19.621	88	39.18	20	50.164	304	45.50	107	58.612	111	55.48	27
June 8.2	14.95	46	40.77	147	19.533	62	39.38	12	49.860	269	44.43	152	58.501	83	55.21	49
18.1	14.49	39	39.30	191	19.471	36	39.50	2	49.591	228	42.91	194	58.418	53	54.72	71
28.1	14.10	32	37.39	231	19.435	8	39.52	7	49.363	181	40.97	229	58.365	18	54.01	88
July 8.1	13.78	23	35.08	264	19.427	21	39.45	17	49.182	127	38.68	259	58.347	16	53.13	106
18.1	13.55	15	32.44	286	19.448	48	39.28	29	49.055	68	36.09	279	58.363	48	52.07	124
28.0	13.40	5	29.58	301	19.496	79	38.99	40	48.987	5	33.30	292	58.411	84	50.83	136
Aug. 7.0	13.35	4	26.57	306	19.575	107	38.59	52	48.982	59	30.38	293	58.495	118	49.47	150
17.0	13.39	15	23.51	301	19.682	135	38.07	67	49.041	127	27.45	286	58.613	150	47.97	162
27.0	13.54	26	20.50	282	19.817	164	37.40	82	49.168	196	24.59	266	58.763	185	46.35	170
Sept. 5.9	13.80	35	17.68	255	19.961	194	36.58	97	49.364	261	21.93	237	58.948	219	44.65	179
15.9	14.15	45	15.13	216	20.175	224	35.61	114	49.625	325	19.56	197	59.167	251	42.86	184
25.9	14.60	53	12.97	167	20.399	251	34.47	129	49.950	382	17.59	149	59.418	281	41.02	187
Oct. 5.8	15.13	60	11.30	112	20.650	276	33.18	144	50.332	432	16.10	92	59.699	313	39.15	188
15.8	15.73	66	10.18	49	20.926	302	31.74	155	50.764	471	15.18	31	60.012	338	37.27	183
25.8	16.39	70	9.69	16	21.228	321	30.19	166	51.235	499	14.87	34	60.350	361	35.44	176
Nov. 4.8	17.09	70	9.85	83	21.549	334	28.53	169	51.734	510	15.21	100	60.711	376	33.68	161
14.7	17.79	68	10.68	150	21.883	341	26.84	169	52.244	508	16.21	162	61.087	384	32.07	144
24.7	18.47	66	12.18	210	22.224	340	25.15	162	52.752	487	17.83	222	61.471	383	30.63	120
Dec. 4.7	19.13	60	14.28	267	22.564	328	23.53	151	53.239	452	20.05	274	61.854	370	29.43	94
14.7	19.73	52	16.95	312	22.892	305	22.02	136	53.691	401	22.79	318	62.224	345	28.49	62
24.6	20.25	42	20.07	351	23.197	276	20.66	114	54.092	341	25.97	350	62.569	310	27.87	30
34.6	20.67		23.58		23.473		19.52		54.433		29.47		62.879		27.57	
Mean Place	16.995		16.01		17.778		43.50		50.386		20.51		56.542		54.51	
Sec δ, Tan δ	2.838		−2.657		1.051		+0.326		1.937		−1.659		1.217		+0.694	
Dψ α, Dω α	+0.01		−0.13		+0.07		+0.02		+0.03		−0.08		+0.07		+0.03	
Dψ δ, Dω δ	−0.3		+0.7		−0.3		+0.7		−0.3		+0.7		−0.3		+0.7	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	θ Pyxidis. Mag. 4.9				α Hydræ. Mag. 2.2				h Ursæ Majoris. Mag. 3.8				d Ursæ Majoris. Mag. 4.6			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	9 17		−25 36		9 23		− 8 17		9 24		+63 25		9 27		+70 11	
	s		″		s		″		s		″		s		″	
Jan. 0.6	47.956	236	24.19	301	29.372	240	38.04	235	59.49	48	34.21	126	9.98	59	47.30	152
10.6	48.192	189	27.20	302	29.612	197	40.39	224	59.97	39	35.47	166	10.57	48	48.82	192
20.6	48.381	137	30.22	293	29.809	150	42.63	207	60.36	29	37.13	201	11.05	37	50.74	229
30.5	48.518	84	33.15	278	29.959	99	44.70	188	60.65	18	39.14	226	11.42	22	53.03	252
Feb. 9.5	48.602	31	35.93	256	30.058	50	46.58	165	60.83	8	41.40	240	11.64	10	55.55	265
19.5	48.633	18	38.49	230	30.108	3	48.23	140	60.91	2	43.80	245	11.74	5	58.20	268
29.5	48.615	62	40.79	201	30.111	39	49.63	113	60.89	12	46.25	239	11.69	17	60.88	258
Mar. 10.4	48.553	98	42.80	168	30.072	75	50.76	88	60.77	20	48.64	222	11.52	28	63.46	240
20.4	48.455	128	44.48	135	29.997	102	51.64	62	60.57	27	50.86	195	11.24	38	65.86	207
30.4	48.327	147	45.83	99	29.895	123	52.26	40	60.30	33	52.81	162	10.86	45	67.93	170
Apr. 9.3	48.180	160	46.82	63	29.772	134	52.66	15	59.97	36	54.43	122	10.41	50	69.63	126
19.3	48.020	164	47.45	27	29.638	137	52.81	6	59.61	38	55.65	77	9.91	52	70.89	77
29.3	47.856	161	47.72	6	29.501	134	52.75	27	59.23	38	56.42	32	9.39	52	71.66	27
May 9.3	47.695	151	47.66	41	29.367	124	52.48	46	58.85	36	56.74	16	8.87	51	71.93	25
19.2	47.544	137	47.25	73	29.243	110	52.02	63	58.49	32	56.58	62	8.36	48	71.68	75
29.2	47.407	118	46.52	103	29.133	93	51.39	78	58.17	29	55.96	106	7.88	41	70.93	122
June 8.2	47.289	96	45.49	130	29.040	71	50.61	91	57.88	24	54.90	146	7.47	35	69.71	166
18.2	47.193	70	44.19	153	28.969	49	49.70	103	57.64	18	53.44	184	7.12	28	68.05	207
28.1	47.123	40	42.66	172	28.920	24	48.67	110	57.46	12	51.60	214	6.84	20	65.98	238
July 8.1	47.083	17	40.94	185	28.896	1	47.57	114	57.34	6	49.46	242	6.64	11	63.60	268
18.1	47.066	17	39.09	193	28.897	29	46.43	115	57.28	1	47.04	265	6.53	2	60.92	290
28.0	47.083	47	37.16	194	28.926	55	45.28	109	57.29	8	44.39	280	6.51	8	58.02	307
Aug. 7.0	47.130	81	35.22	187	28.981	84	44.19	99	57.37	16	41.59	291	6.59	16	54.95	317
17.0	47.211	115	33.35	172	29.065	114	43.20	85	57.53	21	38.68	298	6.75	26	51.78	321
27.0	47.326	149	31.63	152	29.179	142	42.35	63	57.74	27	35.70	297	7.01	34	48.57	319
Sept. 5.9	47.475	182	30.11	122	29.321	173	41.72	39	58.01	35	32.73	293	7.35	43	45.38	312
15.9	47.657	216	28.89	86	29.494	203	41.33	8	58.36	40	29.80	282	7.78	51	42.26	296
25.9	47.873	249	28.03	44	29.697	231	41.25	25	58.76	46	26.98	264	8.29	58	39.30	277
Oct. 5.9	48.122	278	27.59	2	29.928	258	41.50	59	59.22	51	24.34	244	8.87	65	36.53	249
15.8	48.400	305	27.61	50	30.186	286	42.09	95	59.73	55	21.90	214	9.52	70	34.04	218
25.8	48.705	324	28.11	100	30.472	305	43.04	131	60.28	61	19.76	181	10.22	76	31.86	179
Nov. 4.8	49.029	338	29.11	147	30.777	319	44.35	163	60.89	62	17.95	143	10.98	79	30.07	135
14.7	49.367	341	30.58	189	31.096	325	45.98	190	61.51	63	16.52	99	11.77	80	28.72	87
24.7	49.708	337	32.47	229	31.421	324	47.88	213	62.14	63	15.53	51	12.57	80	27.85	36
Dec. 4.7	50.045	321	34.76	261	31.745	312	50.01	228	62.77	60	15.02	1	13.37	77	27.49	18
14.7	50.366	295	37.37	284	32.057	291	52.29	236	63.37	57	15.01	49	14.14	72	27.67	71
24.6	50.661	260	40.21	296	32.348	261	54.65	237	63.94	51	15.50	97	14.86	64	28.38	121
34.6	50.921		43.17		32.609		57.02		64.45		16.47		15.50		29.59	
Mean Place	46.232		28.15		27.602		37.92		55.424		47.95		4.820		61.73	
Sec δ, Tan δ	1.109		−0.479		1.011		−0.146		2.235		+1.999		2.952		+2.778	
$D_\psi \alpha$, $D_\omega \alpha$	+0.05		−0.02		+0.06		−0.01		+0.09		+0.10		+0.11		+0.15	
$D_\psi \delta$, $D_\omega \delta$	−0.3		+0.7		−0.3		+0.6		−0.3		+0.6		−0.3		+0.6	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	θ Ursæ Majoris. Mag. 3.3				ψ Argus. Mag. 3.6				ξ Leonis. Mag. 5.1				10 Leonis Minoris. Mag. 4.6			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	9 27		+52 3		9 27		−40 5		9 27		+11 39		9 29		+36 45	
	s		″		s		″		s		″		s		″	
Jan. 0.6	17.970		26.71		25.022		48.69		27.150		75.71		7.397		65.99	
10.6	18.337	367	27.40	69	25.281	259	52.08	339	27.405	255	74.31	140	7.702	305	65.91	8
20.6	18.642	305	28.49	109	25.486	205	55.55	347	27.619	214	73.14	117	7.958	256	66.18	27
30.5	18.875	233	29.91	142	25.633	147	59.03	348	27.785	166	72.21	93	8.157	199	66.77	59
Feb. 9.5	19.032	157	31.61	170	25.719	86	62.42	339	27.900	115	71.53	68	8.294	137	67.63	86
19.5	19.109	77	33.50	189	25.747	28	65.64	322	27.964	64	71.08	45	8.370	76	68.71	108
29.5	19.108	1	35.48	198	25.718	29	68.61	297	27.979	15	70.86	22	8.386	16	69.95	124
Mar. 10.4	19.038	70	37.46	198	25.640	78	71.28	267	27.949	30	70.83	3	8.346	40	71.27	132
20.4	18.905	133	39.35	189	25.519	121	73.62	234	27.882	67	70.95	12	8.259	87	72.60	133
30.4	18.720	185	41.05	170	25.364	155	75.57	195	27.785	97	71.22	27	8.133	126	73.87	127
Apr. 9.3	18.498	222	42.51	146	25.182	182	77.12	155	27.666	119	71.57	35	7.980	153	75.00	113
19.3	18.253	245	43.66	115	24.985	197	78.24	112	27.536	130	71.97	40	7.809	171	75.98	98
29.3	17.996	257	44.46	80	24.780	205	78.93	69	27.401	135	72.39	42	7.631	178	76.73	75
May 9.3	17.741	255	44.87	41	24.575	205	79.18	25	27.268	133	72.84	45	7.455	176	77.26	53
19.2	17.498	243	44.93	6	24.376	199	79.00	18	27.146	122	73.29	45	7.291	164	77.52	26
29.2	17.279	219	44.57	36	24.190	186	78.40	60	27.038	108	73.71	42	7.144	147	77.53	1
June 8.2	17.089	190	43.85	72	24.024	166	77.38	102	26.949	89	74.09	38	7.021	123	77.28	25
18.2	16.936	153	42.78	107	23.880	144	76.01	137	26.881	68	74.44	35	6.924	97	76.78	50
28.1	16.824	112	41.40	138	23.762	118	74.28	173	26.837	44	74.74	30	6.858	66	76.04	74
July 8.1	16.755	69	39.71	169	23.675	87	72.28	200	26.819	18	74.97	23	6.825	33	75.10	94
18.1	16.732	23	37.79	192	23.620	55	70.06	222	26.827	8	75.12	15	6.824	1	73.94	116
28.0	16.756	24	35.65	214	23.602	18	67.69	237	26.862	35	75.19	7	6.859	35	72.61	133
Aug. 7.0	16.827	71	33.35	230	23.622	20	65.24	245	26.924	62	75.15	4	6.928	69	71.12	149
17.0	16.945	118	30.91	244	23.683	61	62.80	244	27.014	90	74.97	18	7.031	103	69.49	163
27.0	17.110	165	28.38	253	23.786	103	60.46	234	27.133	119	74.65	32	7.168	137	67.72	177
Sept. 5.9	17.321	211	25.79	259	23.931	145	58.33	213	27.279	146	74.16	49	7.342	174	65.85	187
15.9	17.578	257	23.20	259	24.119	188	56.47	186	27.456	177	73.47	69	7.550	208	63.90	195
25.9	17.879	301	20.66	254	24.350	231	54.99	148	27.662	206	72.59	88	7.792	242	61.89	201
Oct. 5.9	18.223	344	18.19	247	24.621	271	53.96	103	27.895	233	71.50	109	8.068	276	59.86	203
15.8	18.607	384	15.86	233	24.929	308	53.44	52	28.158	263	70.22	128	8.377	309	57.83	203
25.8	19.025	418	13.72	214	25.269	340	53.49	5	28.445	287	68.75	147	8.715	338	55.85	198
Nov. 4.8	19.474	449	11.82	190	25.631	362	54.10	61	28.754	309	67.11	164	9.077	362	53.97	188
14.7	19.944	470	10.22	160	26.009	378	55.29	119	29.078	324	65.36	175	9.458	381	52.24	173
24.7	20.426	482	8.96	126	26.392	383	57.02	173	29.411	333	63.55	181	9.850	392	50.71	153
Dec. 4.7	20.907	481	8.10	86	26.769	377	59.26	224	29.741	330	61.72	183	10.243	393	49.44	127
14.7	21.375	468	7.64	46	27.126	357	61.94	268	30.068	327	59.94	178	10.626	383	48.46	98
24.6	21.813	438	7.63	1	27.454	328	64.96	302	30.373	305	58.28	166	10.986	360	47.81	65
34.6	22.210	397	8.05	42	27.742	288	68.23	327	30.648	275	56.76	152	11.315	329	47.52	29
Mean Place	14.885		39.40		23.322		55.75		25.210		80.74		4.967		76.43	
Sec δ, Tan δ	1.626		+1.283		1.307		−0.842		1.021		+0.207		1.248		+0.747	
$D_\psi \alpha$, $D_\omega \alpha$	+0.08		+0.07		+0.05		−0.04		+0.06		+0.01		+0.07		+0.04	
$D_\psi \delta$, $D_\omega \delta$	−0.3		+0.6		−0.3		+0.6		−0.3		+0.6		−0.3		+0.6	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ο Leonis. Mag. 3.8				θ Antliæ. Mag. 5.0				ε Leonis. Mag. 3.1				υ Argus. Mag. 3.2			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	9 36		+10 16		9 40		−27 22		9 41		+24 9		9 44		−64 40	
	s		″		s		″		s		″		s		″	
Jan. 0.6	42.047	261	25.44	150	29.030	258	59.58	302	7.255	284	32.89	82	62.12	38	44.47	352
10.6	42.308	220	23.94	129	29.288	213	62.60	306	7.539	241	32.07	52	62.50	31	47.99	376
20.6	42.528	173	22.65	104	29.501	163	65.66	301	7.780	192	31.55	21	62.81	21	51.75	391
30.5	42.701	124	21.61	78	29.664	110	68.67	290	7.972	137	31.34	6	63.02	11	55.66	395
Feb. 9.5	42.825	73	20.83	55	29.774	57	71.57	270	8.109	84	31.40	32	63.13	1	59.61	389
19.5	42.898	24	20.28	31	29.831	6	74.27	246	8.193	30	31.72	53	63.14	7	63.50	373
29.5	42.922	22	19.97	11	29.837	40	76.73	217	8.223	19	32.25	68	63.07	16	67.23	351
Mar. 10.4	42.900	59	19.86	6	29.797	79	78.90	187	8.204	61	32.93	78	62.91	23	70.74	320
20.4	42.841	88	19.92	21	29.718	110	80.77	154	8.143	95	33.71	83	62.68	30	73.94	284
30.4	42.753	113	20.13	30	29.608	134	82.31	118	8.048	121	34.54	82	62.38	35	76.78	243
Apr. 9.4	42.640	126	20.43	39	29.474	149	83.49	83	7.927	137	35.36	78	62.03	39	79.21	196
19.3	42.514	131	20.82	43	29.325	157	84.32	48	7.790	144	36.14	68	61.64	41	81.17	148
29.3	42.383	130	21.25	45	29.168	158	84.80	12	7.646	144	36.82	58	61.23	43	82.65	96
May 9.3	42.253	121	21.70	46	29.010	153	84.92	23	7.502	137	37.40	44	60.80	43	83.61	44
19.2	42.132	110	22.16	45	28.857	143	84.69	57	7.365	122	37.84	29	60.37	42	84.05	10
29.2	42.022	92	22.61	44	28.714	127	84.12	87	7.243	104	38.13	14	59.95	40	83.95	61
June 8.2	41.930	71	23.05	40	28.587	109	83.25	117	7.139	83	38.27	1	59.55	37	83.34	112
18.2	41.859	50	23.45	35	28.478	87	82.08	142	7.056	58	38.26	18	59.18	33	82.22	159
28.1	41.809	24	23.80	30	28.391	62	80.66	165	6.998	31	38.08	33	58.85	28	80.63	200
July 8.1	41.785	1	24.10	21	28.329	35	79.01	180	6.967	5	37.75	47	58.57	23	78.63	236
18.1	41.784	27	24.31	14	28.294	7	77.21	191	6.962	23	37.28	64	58.34	16	76.27	266
28.1	41.811	52	24.45	3	28.287	24	75.30	194	6.985	52	36.64	78	58.18	9	73.61	284
Aug. 7.0	41.863	80	24.48	10	28.311	57	73.36	192	7.037	82	35.86	93	58.09	1	70.77	296
17.0	41.943	109	24.38	27	28.368	90	71.44	181	7.119	112	34.93	108	58.08	7	67.81	297
27.0	42.052	136	24.11	43	28.458	126	69.63	160	7.231	142	33.85	125	58.15	16	64.84	285
Sept. 5.9	42.188	167	23.68	63	28.584	163	68.03	136	7.373	175	32.60	138	58.31	24	61.99	264
15.9	42.355	197	23.05	83	28.747	199	66.67	100	7.548	206	31.22	152	58.55	32	59.35	231
25.9	42.552	226	22.22	105	28.946	234	65.67	61	7.754	237	29.70	165	58.87	42	57.04	189
Oct. 5.9	42.778	256	21.17	127	29.180	269	65.06	16	7.991	269	28.05	176	59.29	47	55.15	136
15.8	43.034	281	19.90	146	29.449	299	64.90	32	8.260	298	26.29	182	59.76	53	53.79	79
25.8	43.315	304	18.44	165	29.748	322	65.22	82	8.558	321	24.47	186	60.29	57	53.00	15
Nov. 4.8	43.619	321	16.79	177	30.070	340	66.04	132	8.879	340	22.61	185	60.86	60	52.85	51
14.8	43.940	331	15.02	185	30.410	349	67.36	177	9.219	354	20.76	178	61.46	61	53.36	117
24.7	44.271	334	13.17	189	30.759	347	69.13	218	9.573	356	18.98	166	62.07	59	54.53	179
Dec. 4.7	44.605	326	11.28	185	31.106	337	71.31	252	9.929	348	17.32	149	62.66	56	56.32	238
14.7	44.931	307	9.43	176	31.443	313	73.83	278	10.277	332	15.83	126	63.22	51	58.70	288
24.6	45.238	281	7.67	161	31.756	282	76.61	297	10.609	304	14.57	99	63.73	45	61.58	329
34.6	45.519		6.06		32.038		79.58		10.913		13.58		64.18		64.87	
Mean Place	40.165		30.54		27.407		63.84		5.182		41.52		60.188		56.03	
Sec δ, Tan δ	1.016		+0.181		1.126		−0.518		1.096		+0.449		2.339		−2.114	
$D_\psi \alpha$, $D_\omega \alpha$	+0.06		+0.01		+0.05		−0.03		+0.07		+0.02		+0.03		−0.12	
$D_\psi \delta$, $D_\omega \delta$	−0.3		+0.6		−0.3		+0.6		−0.3		+0.6		−0.3		+0.6	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	**υ Ursæ Majoris.** Mag. 3.9				**6 Sextantis.** Mag. 6.0			
	Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 9 45		° ′ +59 25		h m 9 47		° ′ −3 50	
	s		″		s		″	
Jan. 0.6	5.215	449	49.24	87	1.815	259	58.66	218
10.6	5.664	379	50.11	132	2.074	220	60.84	205
20.6	6.043	297	51.43	170	2.294	175	62.89	188
30.6	6.340	208	53.13	201	2.469	126	64.77	166
Feb. 9.5	6.548	115	55.14	222	2.595	77	66.43	144
19.5	6.663	23	57.36	232	2.672	29	67.87	117
29.5	6.686	65	59.68	234	2.701	14	69.04	94
Mar. 10.4	6.621	143	62.02	223	2.687	51	69.98	69
20.4	6.478	207	64.25	203	2.636	83	70.67	47
30.4	6.271	260	66.28	175	2.553	103	71.14	24
Apr. 9.4	6.011	296	68.03	141	2.450	120	71.38	6
19.3	5.715	315	69.44	101	2.330	126	71.44	11
29.3	5.400	322	70.45	59	2.204	126	71.33	28
May 9.3	5.078	311	71.04	13	2.078	120	71.05	42
19.2	4.767	293	71.17	32	1.958	110	70.63	55
29.2	4.474	262	70.85	74	1.848	96	70.08	66
June 8.2	4.212	223	70.11	116	1.752	78	69.42	75
18.2	3.989	179	68.95	154	1.674	59	68.67	82
28.1	3.810	128	67.41	187	1.615	37	67.85	86
July 8.1	3.682	75	65.54	218	1.578	13	66.99	88
18.1	3.607	20	63.36	242	1.565	12	66.11	86
28.1	3.587	37	60.94	264	1.577	36	65.25	80
Aug. 7.0	3.624	95	58.30	278	1.613	64	64.45	69
17.0	3.719	153	55.52	289	1.677	92	63.76	56
27.0	3.872	210	52.63	294	1.769	121	63.20	38
Sept. 5.9	4.082	267	49.69	295	1.890	153	62.82	13
15.9	4.349	322	46.74	289	2.043	183	62.69	14
25.9	4.671	378	43.85	278	2.226	214	62.83	42
Oct. 5.9	5.049	428	41.07	261	2.440	245	63.25	75
15.8	5.477	473	38.46	239	2.685	273	64.00	107
25.8	5.950	512	36.07	209	2.958	296	65.07	137
Nov. 4.8	6.462	544	33.98	175	3.254	316	66.44	166
14.8	7.006	560	32.23	134	3.570	326	68.10	188
24.7	7.566	565	30.89	89	3.896	328	69.98	208
Dec. 4.7	8.131	554	30.00	41	4.224	323	72.06	219
14.7	8.685	525	29.59	8	4.547	304	74.25	224
24.6	9.210	480	29.67	58	4.851	278	76.49	222
34.6	9.690		30.25		5.129		78.71	
Mean Place	1.743		64.34		0.112		56.80	
Sec δ, Tan δ	1.966		+1.693		1.002		−0.067	
$D_\psi \alpha$, $D_\omega \alpha$	+0.09		+0.09		+0.06		0.00	
$D_\psi \delta$, $D_\omega \delta$	−0.3		+0.6		−0.3		+0.5	

Washington Mean Time.	**μ Leonis.** Mag. 4.1				**Groombridge 1586.** Mag. 6.0			
	Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 9 47		° ′ +26 23		h m 9 50		° ′ +73 16	
	s		″		s		″	
Jan. 0.6	61.416	294	61.86	75	59.74	73	29.98	136
10.6	61.710	250	61.11	44	60.47	61	31.34	184
20.6	61.960	201	60.67	11	61.08	48	33.18	224
30.6	62.161	148	60.56	19	61.56	33	35.42	255
Feb. 9.5	62.309	91	60.75	43	61.89	16	37.97	272
19.5	62.400	37	61.18	66	62.05	1	40.69	281
29.5	62.437	12	61.84	81	62.06	13	43.50	275
Mar. 10.4	62.425	56	62.65	90	61.93	28	46.25	259
20.4	62.369	92	63.55	95	61.65	40	48.84	233
30.4	62.277	120	64.50	93	61.25	50	51.17	197
Apr. 9.4	62.157	137	65.43	86	60.75	56	53.14	153
19.3	62.020	146	66.29	76	60.19	61	54.67	105
29.3	61.874	147	67.05	63	59.58	63	55.72	52
May 9.3	61.727	141	67.68	47	58.95	62	56.24	0
19.2	61.586	128	68.15	29	58.33	60	56.24	53
29.2	61.458	110	68.44	12	57.73	55	55.71	105
June 8.2	61.348	90	68.56	5	57.18	49	54.66	152
18.2	61.258	66	68.51	25	56.69	40	53.14	195
28.1	61.192	41	68.26	41	56.29	31	51.19	234
July 8.1	61.151	12	67.85	59	55.98	23	48.85	267
18.1	61.139	17	67.26	76	55.75	13	46.18	295
28.1	61.156	44	66.50	91	55.62	1	43.23	315
Aug. 7.0	61.200	75	65.59	107	55.61	9	40.08	330
17.0	61.275	106	64.52	124	55.70	20	36.78	338
27.0	61.381	136	63.28	138	55.90	31	33.40	340
Sept. 5.9	61.517	170	61.90	153	56.21	40	30.00	335
15.9	61.687	203	60.37	166	56.61	51	26.65	323
25.9	61.890	234	58.71	177	57.12	60	23.42	304
Oct. 5.9	62.124	267	56.94	186	57.72	70	20.38	281
15.8	62.391	297	55.08	192	58.42	77	17.57	248
25.8	62.688	322	53.16	193	59.19	84	15.09	209
Nov. 4.8	63.010	342	51.23	190	60.03	88	13.00	166
14.8	63.352	357	49.33	181	60.91	92	11.34	116
24.7	63.709	361	47.52	166	61.83	92	10.18	64
Dec. 4.7	64.070	355	45.86	147	62.75	90	9.54	6
14.7	64.425	340	44.39	122	63.65	85	9.48	50
24.6	64.765	312	43.17	94	64.50	78	9.98	105
34.6	65.077		42.23		65.28		11.03	
Mean Place	59.338		71.38		54.168		46.76	
Sec δ, Tan δ	1.116		+0.496		3.475		+3.328	
$D_\psi \alpha$, $D_\omega \alpha$	+0.07		+0.03		+0.11		+0.19	
$D_\psi \delta$, $D_\omega \delta$	−0.3		+0.5		−0.3		+0.5	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	19 Leonis Minoris. Mag. 5.2				φ Argus. Mag. 3.7				π Leonis. Mag. 4.9				η Leonis. Mag. 3.6			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 9 52		° ′ +41 26		h m 9 53		° ′ −54 9		h m 9 55		° ′ + 8 26		h m 10 2		° ′ +17 9	
	s		″		s		″		s		″		s		″	
Jan. 0.6	35.152		69.74		56.302		53.94		48.324		46.45		47.077		73.95	
10.6	35.493	341	69.70	4	56.636	334	57.39	345	48.597	273	44.80	165	47.365	288	72.69	126
20.6	35.785	292	70.07	37	56.907	271	61.04	365	48.833	236	43.35	145	47.614	249	71.68	101
30.6	36.019	234	70.81	74	57.107	200	64.81	377	49.023	190	42.16	119	47.818	204	70.97	71
Feb. 9.5	36.192	173	71.87	106	57.234	127	68.60	379	49.164	141	41.21	95	47.972	154	70.54	43
19.5	36.299	107	73.17	130	57.290	56	72.31	371	49.255	91	40.53	68	48.075	103	70.39	15
29.5	36.343	44	74.67	150	57.271	19	75.84	353	49.297	42	40.08	45	48.126	51	70.47	8
Mar. 10.4	36.325	18	76.27	160	57.191	80	79.15	331	49.294	3	39.86	22	48.131	5	70.78	31
20.4	36.254	71	77.88	161	57.053	138	82.14	299	49.252	42	39.83	3	48.094	37	71.23	45
30.4	36.139	115	79.44	156	56.868	185	84.77	263	49.178	74	39.97	14	48.022	72	71.80	57
Apr. 9.4	35.990	149	80.87	143	56.644	224	87.00	223	49.080	98	40.24	27	47.923	99	72.44	64
19.3	35.816	174	82.10	123	56.391	253	88.79	179	48.965	115	40.60	36	47.806	117	73.10	66
29.3	35.630	186	83.10	100	56.120	271	90.10	131	48.842	123	41.02	42	47.680	126	73.75	65
May 9.3	35.440	190	83.82	72	55.839	281	90.94	84	48.717	125	41.49	47	47.550	130	74.36	61
19.3	35.256	184	84.24	42	55.557	282	91.28	34	48.598	119	41.98	49	47.425	125	74.90	54
29.2	35.086	170	84.35	11	55.281	276	91.13	15	48.488	110	42.47	49	47.309	116	75.36	46
June 8.2	34.934	152	84.15	20	55.019	262	90.49	64	48.391	97	42.95	48	47.206	103	75.72	36
18.2	34.808	126	83.63	52	54.778	241	89.39	110	48.313	78	43.41	46	47.119	87	75.96	24
28.1	34.711	97	82.83	80	54.566	212	87.85	154	48.253	60	43.84	43	47.054	65	76.10	14
July 8.1	34.645	66	81.75	108	54.386	180	85.95	190	48.215	38	44.21	37	47.009	45	76.13	3
18.1	34.613	32	80.44	131	54.245	141	83.71	224	48.200	15	44.51	30	46.988	21	76.02	11
28.1	34.614	1	78.88	156	54.149	96	81.20	251	48.208	8	44.72	21	46.991	3	75.77	25
Aug. 7.0	34.652	38	77.14	174	54.104	45	78.52	268	48.242	34	44.83	11	47.021	30	75.38	39
17.0	34.727	75	75.22	192	54.110	6	75.76	276	48.302	60	44.81	2	47.077	56	74.83	55
27.0	34.839	112	73.14	208	54.174	64	73.01	275	48.390	88	44.63	18	47.162	85	74.12	71
Sept. 6.0	34.989	150	70.95	219	54.298	124	70.37	264	48.507	117	44.27	36	47.276	114	73.23	89
15.9	35.177	188	68.67	228	54.484	186	67.95	242	48.654	147	43.71	56	47.421	145	72.17	106
25.9	35.404	227	66.34	233	54.729	245	65.86	209	48.833	179	42.92	79	47.599	178	70.91	126
Oct. 5.9	35.670	266	63.99	235	55.031	302	64.19	167	49.044	211	41.91	101	47.809	210	69.48	143
15.8	35.973	303	61.66	233	55.388	357	63.01	118	49.284	240	40.67	124	48.052	243	67.87	161
25.8	36.312	339	59.40	226	55.790	402	62.40	61	49.555	271	39.21	146	48.325	273	66.13	174
Nov. 4.8	36.679	367	57.29	211	56.228	438	62.41	1	49.851	296	37.55	166	48.626	301	64.27	186
14.8	37.072	393	55.34	195	56.690	462	63.04	63	50.167	316	35.74	181	48.948	322	62.34	193
24.7	37.479	407	53.65	169	57.164	474	64.30	126	50.496	329	33.82	192	49.286	338	60.40	194
Dec. 4.7	37.895	416	52.24	141	57.634	470	66.17	187	50.830	334	31.85	197	49.630	344	58.50	190
14.7	38.304	409	51.18	106	58.083	449	68.56	239	51.161	331	29.89	196	49.973	343	56.70	180
24.7	38.695	391	50.51	67	58.500	417	71.43	287	51.476	315	28.00	189	50.302	329	55.07	163
34.6	39.057	362	50.24	27	58.869	369	74.68	325	51.767	291	26.24	176	50.607	305	53.65	142
Mean Place	32.714		82.69		54.658		64.00		46.547		51.90		45.224		82.03	
Sec δ, Tan δ	1.334		+0.883		1.708		−1.385		1.011		+0.148		1.047		+0.309	
$D_\psi \alpha$, $D_\omega \alpha$	+0.07		+0.05		+0.04		−0.08		+0.06		+0.01		+0.06		+0.02	
$D_\psi \delta$. $D_\omega \delta$	−0.3		+0.5		−0.3		+0.5		−0.3		+0.5		−0.3		+0.5	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Leonis. (*Regulus.*) Mag. 1.3				λ Hydræ. Mag. 3.8				*q* Velorum. Mag. 4.1				32 Ursæ Majoris. Mag. 5.7			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	10 3		+12 22		10 6		−11 56		10 11		−41 42		10 11		+65 31	
	s		″		s		″		s		″		s		″	
Jan. 0.6	55.806	283	34.68	150	31.139	273	18.27	250	13.838	311	11.81	321	60.85	56	22.78	84
10.6	56.089	245	33.18	126	31.412	236	20.77	245	14.149	263	15.02	339	61.41	49	23.62	134
20.6	56.334	200	31.92	100	31.648	190	23.22	232	14.412	207	18.41	346	61.90	40	24.96	179
30.6	56.534	151	30.92	72	31.838	142	25.54	215	14.619	149	21.87	345	62.30	29	26.75	214
Feb. 9.5	56.685	101	30.20	46	31.980	93	27.69	193	14.768	88	25.32	335	62.59	19	28.89	242
19.5	56.786	51	29.74	20 —	32.073	45	29.62	169	14.856	32 —	28.67	317	62.78	7 —	31.31	257
29.5	56.837	5 —	29.54	1	32.118	2 —	31.31	144	14.888	21	31.84	293	62.85	3	33.88	260
Mar. 10.5	56.842	35	29.55	20	32.120	38	32.75	116	14.867	69	34.77	264	62.82	13	36.48	253
20.4	56.807	69	29.75	34	32.082	70	33.91	91	14.798	110	37.41	231	62.69	22	39.01	237
30.4	56.738	94	30.09	44	32.012	93	34.82	64	14.688	140	39.72	194	62.47	30	41.38	207
Apr. 9.4	56.644	113	30.53	50	31.919	111	35.46	39	14.548	166	41.66	154	62.17	34	43.45	174
19.3	56.531	122	31.03	54	31.808	123	35.85	15 —	14.382	181	43.20	113	61.83	39	45.19	133
29.3	56.409	125	31.57	54	31.685	125	36.00	7	14.201	191	44.33	71	61.44	40	46.52	89
May 9.3	56.284	122	32.11	53	31.560	123	35.93	29	14.010	193	45.04	28	61.04	41	47.41	37 —
19.3	56.162	112	32.64	49	31.437	116	35.64	48	13.817	189	45.32	16	60.63	39	47.78	13
29.2	56.050	101	33.13	44	31.321	106	35.16	68	13.628	180	45.16	58	60.24	37	47.65	60
June 8.2	55.949	84	33.57	37	31.215	91	34.48	83	13.448	165	44.58	97	59.87	33	47.05	107
18.2	55.865	64	33.94	31	31.124	74	33.65	97	13.283	147	43.61	135	59.54	29	45.98	150
28.2	55.801	45	34.25	21	31.050	56	32.68	108	13.136	123	42.26	168	59.25	23	44.48	192
July 8.1	55.756	21 —	34.46	11	30.994	34	31.60	115	13.013	97	40.58	194	59.02	17	42.56	226
18.1	55.735	1	34.57	1 —	30.960	11 —	30.45	119	12.916	66	38.64	218	58.85	10	40.30	257
28.1	55.736	28	34.58	12	30.949	14	29.26	116	12.850	30 —	36.46	231	58.75	4 —	37.73	283
Aug. 7.0	55.764	53	34.46	27	30.963	40	28.10	110	12.820	8	34.15	238	58.71	3	34.90	303
17.0	55.817	81	34.19	42	31.003	71	27.00	99	12.828	50	31.77	236	58.74	10	31.87	316
27.0	55.898	111	33.77	60	31.074	100	26.01	81	12.878	94	29.41	225	58.84	18	28.71	323
Sept. 6.0	56.009	141	33.17	81	31.174	133	25.20	58	12.972	141	27.16	203	59.02	25	25.48	329
15.9	56.150	173	32.36	100	31.307	166	24.62	29 —	13.113	188	25.13	173	59.27	32	22.19	323
25.9	56.323	205	31.36	122	31.473	201	24.33	2	13.301	234	23.40	134	59.59	39	18.96	312
Oct. 5.9	56.528	237	30.14	141	31.674	233	24.35	39	13.535	280	22.06	89	59.98	46	15.84	298
15.9	56.765	268	28.73	161	31.907	266	24.74	76	13.815	321	21.17	37 —	60.44	53	12.86	270
25.8	57.033	295	27.12	176	32.173	291	25.50	113	14.136	355	20.80	18	60.97	57	10.16	240
Nov. 4.8	57.328	316	25.36	188	32.464	315	26.63	149	14.491	380	20.98	76	61.54	62	7.76	203
14.8	57.644	331	23.48	194	32.779	328	28.12	180	14.871	396	21.74	131	62.16	65	5.73	161
24.7	57.975	338	21.54	196	33.107	334	29.92	209	15.267	399	23.05	185	62.81	67	4.12	111
Dec. 4.7	58.313	336	19.58	191	33.441	330	32.01	229	15.666	390	24.90	233	63.48	66	3.01	57
14.7	58.649	323	17.67	179	33.771	315	34.30	243	16.056	370	27.23	274	64.14	64	2.44	6 —
24.7	58.972	299	15.88	162	34.086	291	36.73	249	16.426	335	29.97	306	64.78	61	2.38	52
34.6	59.271		14.26		34.377		39.22		16.761		33.03		65.39		2.90	
Mean Place	54.023		41.53		29.579		18.16		12.373		19.48		57.046		40.72	
Sec δ, Tan δ	1.024		+0.219		1.022		−0.212		1.340		−0.891		2.413		+2.196	
$D_\psi \alpha$, $D_\omega \alpha$	+0.06		+0.01		+0.06		−0.01		+0.05		−0.05		+0.09		+0.13	
$D_\psi \delta$, $D_\omega \delta$	−0.3		+0.5		−0.3		+0.5		−0.4		+0.5		−0.4		+0.5	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ζ Leonis. Mag. 3.6				λ Ursæ Majoris. Mag. 3.5				γ Leonis pr. Mag. 2.6				μ Ursæ Majoris. Mag. 3.2			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 10 12		° ′ +23 49		h m 10 12		° ′ +43 19		h m 10 15		° ′ +20 15		h m 10 17		° ′ +41 54	
	s		″		s		″		s		″		s		″	
Jan. 0.7	3.201		60.75		4.637		49.18		22.457		51.35		22.147		66.05	
10.6	3.506	305	59.74	101	5.000	363	49.07	11 —	22.757	300	50.16	119	22.508	361	65.83	22 —
20.6	3.773	267	59.05	69	5.318	318	49.39	32	23.021	264	49.25	91	22.825	317	66.04	21
30.6	3.994	221	58.69	36	5.579	261	50.12	73	23.241	220	48.66	59	23.088	263	66.67	63
Feb. 9.5	4.163	169	58.63	6 —	5.779	200	51.21	109	23.411	170	48.39	27	23.291	203	67.64	97
19.5	4.279	116	58.88	25	5.911	132	52.58	137	23.529	118	48.39	0	23.429	138	68.93	129
29.5	4.342	63	59.37	49	5.980	69	54.18	160	23.595	66	48.66	27	23.503	74	70.45	152
Mar. 10.5	4.356	14 —	60.06	69	5.985	5 —	55.90	172	23.613	18 —	49.14	48	23.516	13 —	72.13	168
20.4	4.324	32	60.88	82	5.932	53	57.67	177	23.588	25	49.77	63	23.473	43	73.85	172
30.4	4.256	68	61.80	92	5.831	101	59.41	174	23.526	62	50.52	75	23.382	91	75.56	171
Apr. 9.4	4.158	98	62.73	93	5.693	138	61.01	160	23.436	90	51.32	80	23.252	130	77.15	159
19.4	4.039	119	63.64	91	5.525	168	62.44	143	23.324	112	52.13	81	23.094	158	78.59	144
29.3	3.908	131	64.48	84	5.340	185	63.61	117	23.200	124	52.90	77	22.918	176	79.79	120
May 9.3	3.773	135	65.21	73	5.147	193	64.51	90	23.071	129	53.59	69	22.733	185	80.74	95
19.3	3.639	134	65.81	60	4.955	192	65.09	58	22.943	128	54.19	60	22.549	184	81.37	63
29.2	3.512	127	66.27	46	4.773	182	65.33	24 —	22.824	119	54.68	49	22.372	177	81.68	31 —
June 8.2	3.400	112	66.55	28	4.607	166	65.25	8	22.715	109	55.04	36	22.210	162	81.67	1
18.2	3.303	97	66.67	12 —	4.461	146	64.83	42	22.621	94	55.25	21	22.067	143	81.33	34
28.2	3.227	76	66.61	6	4.343	118	64.09	74	22.547	74	55.32	7 —	21.949	118	80.67	66
July 8.1	3.171	56	66.36	25	4.252	91	63.03	106	22.493	54	55.23	9	21.858	91	79.72	95
18.1	3.140	31	65.95	41	4.194	58	61.71	132	22.461	32	54.98	25	21.798	60	78.47	125
28.1	3.133	7 —	65.36	59	4.169	25 —	60.12	159	22.452	9 —	54.57	41	21.769	29 —	76.98	149
Aug. 7.0	3.153	20	64.59	77	4.180	11	58.30	182	22.471	19	54.01	56	21.773	4	75.23	175
17.0	3.201	48	63.65	94	4.226	46	56.27	203	22.515	44	53.26	75	21.814	41	73.29	194
27.0	3.278	77	62.53	112	4.312	86	54.08	219	22.588	73	52.35	91	21.891	77	71.16	213
Sept. 6.0	3.387	109	61.24	129	4.436	124	51.74	234	22.691	103	51.25	110	22.007	116	68.88	228
15.9	3.527	140	59.78	146	4.601	165	49.29	245	22.826	135	49.98	127	22.162	155	66.49	239
25.9	3.702	175	58.15	163	4.808	207	46.78	251	22.996	170	48.52	146	22.358	196	64.01	248
Oct. 5.9	3.911	209	56.39	176	5.056	248	44.23	255	23.198	202	46.90	162	22.596	238	61.48	253
15.9	4.154	243	54.50	189	5.345	289	41.70	253	23.433	235	45.13	177	22.873	277	58.96	252
25.8	4.429	275	52.52	198	5.672	327	39.24	246	23.702	269	43.24	189	23.190	317	56.49	247
Nov. 4.8	4.735	306	50.48	204	6.034	362	36.92	232	24.001	299	41.26	198	23.542	352	54.13	236
14.8	5.064	329	48.44	204	6.426	392	34.79	213	24.323	322	39.24	202	23.924	382	51.95	218
24.7	5.412	348	46.46	198	6.838	412	32.90	189	24.663	340	37.23	201	24.328	404	50.00	195
Dec. 4.7	5.769	357	44.58	188	7.261	423	31.33	157	25.013	350	35.29	194	24.743	415	48.34	166
14.7	6.124	355	42.89	169	7.684	423	30.13	120	25.362	349	33.49	180	25.160	417	47.06	128
24.7	6.468	344	41.42	147	8.093	409	29.32	81	25.701	339	31.89	160	25.563	403	46.15	91
34.6	6.790	322	40.23	119	8.476	383	28.95	37	26.018	317	30.52	137	25.942	379	45.67	48
Mean Place	1.296		71.01		2.266		63.86		20.627		60.85		19.861		80.79	
Sec δ, Tan δ	1.093		+0.442		1.375		+0.943		1.066		+0.369		1.344		+0.898	
$D_\psi a$, $D_\omega a$	+0.07		+0.03		+0.07		+0.06		+0.07		+0.02		+0.07		+0.05	
$D_\psi \delta$, $D_\omega \delta$	−0.4		+0.5		−0.4		+0.5		−0.4		+0.4		−0.1		+0.4	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	30 H. Ursæ Majoris. Mag. 4.9				μ Hydræ. Mag. 4.1				31 Leonis Minoris. Mag. 4.4				α Antliæ. Mag. 4.4			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	10 18		+65 58		10 22		−16 24		10 23		+37 7		10 23		−30 38	
	s		″		s		″		s		″		s		″	
Jan. 0.7	9.58		71.86		3.099		24.47		4.011		62.72		19.776		19.36	
10.6	10.16	58	72.64	78	3.384	285	27.10	263	4.357	346	62.23	49	20.076	300	22.33	297
20.6	10.66	50	73.95	131	3.633	249	29.72	262	4.663	306	62.16	7	20.336	260	25.41	308
30.6	11.08	42	75.71	176	3.838	205	32.24	252	4.918	255	62.48	32	20.548	212	28.51	310
Feb. 9.5	11.40	32	77.84	213	3.995	157	34.64	240	5.118	200	63.17	69	20.708	160	31.54	303
19.5	11.59	19	80.25	241	4.104	109	36.83	219	5.257	139	64.17	100	20.816	108	34.44	290
29.5	11.68	9	82.84	259	4.164	60	38.80	197	5.336	79	65.43	126	20.872	56	37.16	272
Mar. 10.5	11.66	2	85.48	264	4.180	16	40.51	171	5.358	22	66.85	142	20.880	8	39.63	247
20.4	11.54	12	88.06	258	4.155	25	41.96	145	5.328	30	68.37	152	20.844	36	41.82	219
30.4	11.32	22	90.47	241	4.098	57	43.13	117	5.252	76	69.91	154	20.773	71	43.71	189
Apr. 9.4	11.03	29	92.62	215	4.014	84	44.03	90	5.140	112	71.39	148	20.672	101	45.26	155
19.4	10.69	34	94.41	179	3.910	104	44.64	61	5.001	139	72.74	135	20.549	123	46.46	120
29.3	10.30	39	95.81	140	3.793	117	44.99	35	4.846	155	73.91	117	20.411	138	47.31	85
May 9.3	9.89	41	96.74	93	3.670	123	45.08	9	4.680	166	74.86	95	20.264	147	47.81	50
19.3	9.47	42	97.19	45	3.546	124	44.91	17	4.515	165	75.55	69	20.115	149	47.95	14
29.2	9.07	40	97.14	5	3.427	119	44.52	39	4.356	159	75.97	42	19.968	147	47.73	22
June 8.2	8.69	38	96.60	54	3.315	112	43.90	62	4.209	147	76.08	11	19.829	139	47.18	55
18.2	8.34	35	95.59	101	3.214	101	43.09	81	4.079	130	75.91	17	19.700	129	46.30	88
28.2	8.04	30	94.13	146	3.128	86	42.10	99	3.972	107	75.45	46	19.588	112	45.13	117
July 8.1	7.80	24	92.26	187	3.060	68	40.95	115	3.887	85	74.71	74	19.492	96	43.69	144
18.1	7.61	19	90.02	224	3.011	49	39.70	125	3.831	56	73.71	100	19.419	73	42.05	164
28.1	7.49	12	87.46	256	2.984	27	38.39	131	3.803	28	72.46	125	19.369	50	40.25	180
Aug. 7.1	7.43	6	84.64	282	2.980	4	37.05	134	3.804	1	70.98	148	19.349	20	38.34	191
17.0	7.45	2	81.60	304	3.005	25	35.75	130	3.838	34	69.29	169	19.359	10	36.40	194
27.0	7.54	9	78.41	319	3.057	52	34.56	119	3.906	68	67.41	188	19.402	43	34.51	189
Sept. 6.0	7.70	16	75.13	328	3.141	84	33.51	105	4.010	104	65.35	206	19.484	82	32.73	178
15.9	7.94	24	71.82	331	3.259	118	32.69	82	4.150	140	63.17	218	19.604	120	31.18	155
25.9	8.25	31	68.54	328	3.413	154	32.13	56	4.329	179	60.86	231	19.765	161	29.90	128
Oct. 5.9	8.63	38	65.35	319	3.603	190	31.91	22	4.548	219	58.48	238	19.968	203	28.98	92
15.9	9.08	45	62.33	302	3.829	226	32.06	15	4.806	258	56.06	242	20.211	243	28.47	51
25.8	9.60	52	59.54	279	4.089	260	32.60	54	5.101	295	53.65	241	20.490	279	28.43	4
Nov. 4.8	10.17	57	57.06	248	4.379	290	33.53	93	5.431	330	51.31	234	20.804	314	28.87	44
14.8	10.79	62	54.95	211	4.693	314	34.87	134	5.790	359	49.08	223	21.143	339	29.83	96
24.8	11.45	66	53.27	168	5.024	331	36.57	170	6.171	381	47.05	203	21.501	358	31.27	144
Dec. 4.7	12.13	68	52.08	119	5.363	339	38.59	202	6.564	393	45.27	178	21.865	364	33.16	189
14.7	12.80	67	51.43	65	5.701	338	40.87	228	6.960	396	43.79	148	22.227	362	35.45	229
24.7	13.45	65	51.32	11	6.026	325	43.34	247	7.345	385	42.67	112	22.572	345	38.06	261
34.6	14.07	62	51.76	44	6.328	302	45.94	260	7.708	363	41.94	73	22.892	320	40.91	285
Mean Place	5.802		90.34		1.636		25.35		1.899		76.80		18.372		24.24	
Sec δ, Tan δ	2.458		+2.245		1.042		−0.294		1.254		+0.757		1.163		−0.592	
$D_\psi \alpha$, $D_\omega \alpha$	+0.09		+0.14		+0.06		−0.02		+0.07		+0.05		+0.05		−0.04	
$D_\psi \delta$, $D_\omega \delta$	−0.4		+0.4		−0.4		+0.4		−0.4		+0.4		−0.4		+0.4	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	**36 Ursæ Majoris.** Mag. 4.8				**9 H. Draconis.** Mag. 5.0				**ρ Leonis.** Mag. 3.8				**33 Sextantis.** Mag. 6.4		
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Decli- tio
	h m		° ′		h m		° ′		h m		° ′		h m		°
	10 25		+56 24		10 27		+76 8		10 28		+ 9 43		10 37		− 1
	s		″		s		″		s		″		s		″
Jan. 0.7	18.566	459	24.32	33	65.29	93	26.51	102	25.024	296	74.29	169	9.269	293	61.99
10.6	19.025	405	24.65	82	66.22	82	27.53	157	25.320	261	72.60	149	9.562	261	64.13
20.6	19.430	337	25.47	129	67.04	66	29.10	205	25.581	219	71.11	121	9.823	220	66.13
30.6	19.767	261	26.76	168	67.70	51	31.15	243	25.800	173	69.90	95	10.043	176	67.96
Feb. 9.6	20.028	177	28.44	198	68.21	33	33.58	271	25.973	125	68.95	66	10.219	128	69.55
19.5	20.205	93	30.42	222	68.54	14	36.29	288	26.098	76	68.29	41	10.347	81	70.90
29.5	20.298	10	32.64	232	68.68	4	39.17	292	26.174	30	67.88	15	10.428	37	71.99
Mar. 10.5	20.308	64	34.96	232	68.64	22	42.09	284	26.204	11	67.73	5	10.465	3	72.84
20.4	20.244	131	37.28	223	68.42	38	44.93	262	26.193	45	67.78	24	10.462	38	73.43
30.4	20.113	187	39.51	204	68.04	50	47.55	234	26.148	74	68.02	36	10.424	66	73.80
Apr. 9.4	19.926	230	41.55	176	67.54	62	49.89	194	26.074	94	68.38	46	10.358	86	73.97
19.4	19.696	260	43.31	144	66.92	70	51.83	149	25.980	108	68.84	53	10.272	100	73.97
29.3	19.436	275	44.75	105	66.22	75	53.32	97	25.872	115	69.37	55	10.172	108	73.80
May 9.3	19.161	280	45.80	63	65.47	77	54.29	43	25.757	116	69.92	57	10.064	110	73.51
19.3	18.881	273	46.43	20	64.70	77	54.72	11	25.641	110	70.49	54	9.954	108	73.11
29.3	18.608	256	46.63	24	63.93	72	54.61	65	25.531	103	71.03	52	9.846	101	72.61
June 8.2	18.352	233	46.39	68	63.21	68	53.96	117	25.428	90	71.55	47	9.745	92	72.04
18.2	18.119	201	45.71	109	62.53	62	52.79	167	25.338	75	72.02	40	9.653	80	71.42
28.2	17.918	165	44.62	147	61.91	52	51.12	211	25.263	59	72.42	35	9.573	63	70.75
July 8.1	17.753	123	43.15	181	61.39	42	49.01	252	25.204	39	72.77	24	9.510	47	70.07
18.1	17.630	80	41.34	214	60.97	30	46.49	284	25.165	18	73.01	12	9.463	27	69.39
28.1	17.550	32	39.20	240	60.67	20	43.65	314	25.147	4	73.13	2	9.436	7	68.75
Aug. 7.1	17.518	17	36.80	265	60.47	8	40.51	334	25.151	30	73.15	13	9.429	18	68.18
17.0	17.535	68	34.15	281	60.39	7	37.17	350	25.181	55	73.02	31	9.447	43	67.70
27.0	17.603	120	31.34	295	60.46	18	33.67	358	25.236	86	72.71	48	9.490	74	67.35
Sept. 6.0	17.723	175	28.39	304	60.64	31	30.09	360	25.322	115	72.23	69	9.564	105	67.19
16.0	17.898	230	25.35	306	60.95	46	26.49	352	25.437	150	71.54	90	9.669	136	67.23
25.9	18.128	285	22.29	303	61.41	56	22.97	340	25.587	182	70.64	114	9.805	173	67.53
Oct. 5.9	18.413	338	19.26	293	61.97	68	19.57	319	25.769	217	69.50	135	9.978	207	68.08
15.9	18.751	390	16.33	278	62.65	80	16.38	292	25.986	250	68.15	157	10.185	242	68.93
25.8	19.141	435	13.55	256	63.45	89	13.46	256	26.236	280	66.58	175	10.427	272	70.0
Nov. 4.8	19.576	474	10.99	226	64.34	97	10.90	213	26.516	306	64.83	190	10.699	300	71.48
14.8	20.050	505	8.73	190	65.31	103	8.77	165	26.822	325	62.93	201	10.999	319	73.17
24.8	20.555	521	6.83	148	66.34	106	7.12	110	27.147	335	60.92	206	11.318	332	75.07
Dec. 4.7	21.076	524	5.35	102	67.40	107	6.02	53	27.482	338	58.86	203	11.650	334	77.14
14.7	21.600	511	4.33	50	68.47	103	5.49	8	27.820	329	56.83	196	11.984	326	79.31
24.7	22.111	480	3.83	2	69.50	98	5.57	68	28.149	309	54.87	182	12.310	308	81.5
34.7	22.591		3.85		70.48		6.25		28.458		53.05		12.618		83.6
Mean Place	15.712		42.15		59.569		46.50		23.397		81.40		7.785		57.9
Sec δ, Tan δ	1.808		+1.505		4.175		+4.055		1.014		+0.172		1.000		−0.0
$D_\psi \alpha$, $D_\omega \alpha$	+0.08		+0.09		+0.10		+0.25		+0.06		+0.01		+0.06		0.0
$D_\psi \delta$, $D_\omega \delta$	−0.4		+0.4		−0.4		+0.4		−0.4		+0.4		−0.4		+0.4

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	**41 Leonis Minoris.** Mag. 5.0				**θ Argus.** Mag. 3.0				**42 Leonis Minoris.** Mag. 5.4				**η Argus.** Var. 1.6–6.6			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	10 38		+23 37		10 39		−63 57		10 41		+31 6		10 41		−59 14	
	s		″		s		″		s		″		s		″	
Jan. 0.7	52.853		31.17		58.74		4.56		13.730		76.58		49.233		22.17	
		320		118		49		308		339		90		440		309
10.6	53.173		29.99		59.23		7.64		14.069		75.68		49.673		25.26	
		287		84		41		343		303		49		377		342
20.6	53.460		29.15		59.64		11.07		14.372		75.19		50.050		28.68	
		243		50		33		368		259		10		307		364
30.6	53.703		28.65		59.97		14.75		14.631		75.09	—	50.357		32.32	
		195		15		25		383		208		27		230		377
Feb. 9.6	53.898		28.50	—	60.22		18.58		14.839		75.36		50.587		36.09	
		144		17		15		388		153		61		151		381
19.5	54.042		28.67		60.37		22.46		14.992		75.97		50.738		39.90	
		90		44		8		385		98		88		74		376
29.5	54.132		29.11		60.45	—	26.31		15.090		76.85		50.812	—	43.66	
		42		68		2		372		43		112		1		362
Mar. 10.5	54.174	—	29.79		60.43		30.03		15.133	—	77.97		50.811		47.28	
		2		85		10		353		5		126		68		339
20.4	54.172		30.64		60.33		33.56		15.128		79.23		50.743		50.67	
		44		97		17		324		48		134		130		312
30.4	54.128		31.61		60.16		36.80		15.080		80.57		50.613		53.79	
		76		102		23		290		84		135		183		278
Apr. 9.4	54.052		32.63		59.93		39.70		14.996		81.92		50.430		56.57	
		99		102		28		252		111		128		227		239
19.4	53.953		33.65		59.65		42.22		14.885		83.20		50.203		58.96	
		118		97		31		208		129		117		261		197
29.3	53.835		34.62		59.34		44.30		14.756		84.37		49.942		60.93	
		126		88		35		162		140		101		285		150
May 9.3	53.709		35.50		58.99		45.92		14.616		85.33		49.657		62.43	
		129		74		37		111		144		82		303		101
19.3	53.580		36.24		58.62		47.03		14.472		86.20		49.354		63.44	
		126		60		38		61		142		59		310		52
29.3	53.454		36.84		58.24		47.64		14.330		86.79		49.044		63.96	
		118		43		38		9		133		34		311		0
June 8.2	53.336		37.27		57.86		47.73	—	14.197		87.13		48.733		63.96	
		106		23		37		44		120		10		301		49
18.2	53.230		37.50		57.49		47.29		14.077		87.23	—	48.432		63.47	
		92		5		35		94		105		17		286		97
28.2	53.138		37.55	—	57.14		46.35		13.972		87.06		48.146		62.50	
		72		15		33		141		86		40		260		142
July 8.1	53.066		37.40		56.81		44.94		13.886		86.66		47.886		61.08	
		54		34		28		185		63		67		228		183
18.1	53.012		37.06		56.53		43.09		13.823		85.99		47.658		59.25	
		30		53		24		221		40		89		187		218
28.1	52.982		36.53		56.29		40.88		13.783		85.10		47.471		57.07	
		8		74		17		252		14		113		140		246
Aug. 7.1	52.974	—	35.79		56.12		38.36		13.769	—	83.97		47.331		54.61	
		19		93		11		273		15		134		84		267
17.0	52.993		34.86		56.01		35.63		13.784		82.63		47.247		51.94	
		47		113		3		286		43		156		21		277
27.0	53.040		33.73		55.98	—	32.77		13.827		81.07		47.226	—	49.17	
		78		131		4		288		78		174		48		278
Sept. 6.0	53.118		32.42		56.02		29.89		13.905		79.33		47.274		46.39	
		111		150		13		279		113		192		118		268
16.0	53.229		30.92		56.15		27.10		14.018		77.41		47.392		43.71	
		145		169		22		258		150		209		193		246
25.9	53.374		29.23		56.37		24.52		14.168		75.32		47.585		41.25	
		182		185		31		227		186		220		267		215
Oct. 5.9	53.556		27.38		56.68		22.25		14.354		73.12		47.852		39.10	
		219		199		38		185		227		230		339		173
15.9	53.775		25.39		57.06		20.40		14.581		70.82		48.191		37.37	
		254		210		46		136		264		235		402		124
25.8	54.029		23.29		57.52		19.04		14.845		68.47		48.593		36.13	
		286		216		52		79		299		236		458		67
Nov. 4.8	54.315		21.13		58.04		18.25		15.144		66.11		49.051		35.46	
		317		218		57		17		331		230		502		5
14.8	54.632		18.95		58.61		18.08	—	15.475		63.81		49.553		35.41	—
		338		214		60		48		356		218		529		57
24.8	54.970		16.81		59.21		18.56		15.831		61.63		50.082		35.98	
		354		204		61		113		370		201		541		120
Dec. 4.7	55.324		14.77		59.82		19.69		16.201		59.62		50.623		37.18	
		356		188		60		173		376		176		534		180
14.7	55.680		12.89		60.42		21.42		16.577		57.86		51.157		38.98	
		351		164		58		231		370		146		511		236
24.7	56.031		11.25		61.00		23.73		16.947		56.40		51.668		41.34	
		334		137		52		280		354		111		471		281
34.7	56.365		9.88		61.52		26.53		17.301		55.29		52.139		44.15	
Mean Place	51.109		42.71		57.356		16.84		11.871		90.24		47.913		33.68	
Sec δ, Tan δ	1.091		+0.437		2.278		−2.046		1.168		+0.604		1.955		−1.680	
$D_\psi \alpha$, $D_\omega \alpha$	+0.07		+0.03		+0.04		−0.13		+0.07		+0.04		+0.05		−0.11	
$D_\psi \delta$, $D_\omega \delta$	−0.4		+0.3		−0.4		+0.3		−0.4		+0.3		−0.4		+0.3	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	μ Argus. Mag. 2.8				l Leonis. Mag. 5.3				δ² Chamæleon. Mag. 4.6				ν Hydræ. Mag. 3.3			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	10 43		−48 58		10 44		+10 58		10 44		−80 5		10 45		−15 45	
	s		″		s		″		s		″		s		″	
Jan. 0.7	10.458		25.50		52.184		75.55		62.31		35.39		30.078		12.61	
10.6	10.830	372	28.58	308	52.490	306	73.84	171	63.39	108	38.19	280	30.379	301	15.17	256
20.6	11.154	324	31.91	333	52.764	274	72.37	147	64.30	91	41.46	327	30.647	268	17.72	255
30.6	11.420	266	35.43	352	52.999	235	71.17	120	65.01	71	45.05	359	30.873	226	20.21	249
Feb. 9.6	11.626	206	39.02	359	53.188	189	70.25	92	65.53	52	48.86	381	31.055	182	22.57	236
19.5	11.767	141	42.59	357	53.329	141	69.64	61	65.82	29	52.82	396	31.190	135	24.72	215
29.5	11.845	78	46.05	346	53.422	93	69.31	33	65.91	9 —	56.81	399	31.277	87	26.67	195
Mar. 10.5	11.863	18 —	49.36	331	53.468	46	69.22	9 —	65.79	12	60.75	394	31.319	42	28.37	170
20.5	11.827	36	52.41	305	53.473	5 —	69.35	13	65.47	32	64.57	382	31.322	3 —	29.82	145
30.4	11.742	85	55.19	278	53.441	32	69.67	32	64.97	50	68.13	356	31.288	34	30.99	117
Apr. 9.4	11.617	125	57.62	243	53.380	61	70.12	45	64.32	65	71.45	332	31.225	63	31.91	92
19.4	11.459	158	59.67	205	53.296	84	70.66	54	63.52	80	74.39	294	31.141	84	32.55	64
29.3	11.275	184	61.32	165	53.197	99	71.26	60	62.61	91	76.91	252	31.041	100	32.94	39
May 9.3	11.074	201	62.54	122	53.089	108	71.88	62	61.60	101	78.98	207	30.930	111	33.08	14 —
19.3	10.860	214	63.30	76	52.977	112	72.50	62	60.52	108	80.55	157	30.816	114	32.99	9
29.3	10.642	218	63.61	31 —	52.867	110	73.09	59	59.40	112	81.59	104	30.701	115	32.66	33
June 8.2	10.425	217	63.45	16	52.763	104	73.63	54	58.25	115	82.06	47 —	30.590	111	32.14	52
18.2	10.217	208	62.85	60	52.668	95	74.11	48	57.14	111	82.02	4	30.488	102	31.42	72
28.2	10.021	196	61.82	103	52.585	83	74.51	40	56.05	109	81.39	63	30.396	92	30.53	89
July 8.2	9.844	177	60.40	142	52.519	66	74.81	30	55.04	101	80.25	114	30.316	80	29.49	104
18.1	9.692	152	58.62	178	52.468	51	75.00	19	54.13	91	78.63	162	30.254	62	28.34	115
28.1	9.569	123	56.54	208	52.437	31	75.08	8 —	53.35	78	76.54	209	30.211	43	27.13	121
Aug. 7.1	9.483	86	54.24	230	52.426	11 —	75.03	5	52.72	63	74.12	242	30.189	22 —	25.89	124
17.0	9.438	45 —	51.79	245	52.440	14	74.81	22	52.28	44	71.37	275	30.192	3	24.68	121
27.0	9.439	1	49.27	252	52.479	39	74.43	38	52.05	23	68.44	293	30.222	30	23.55	113
Sept. 6.0	9.491	52	46.78	249	52.548	69	73.86	57	52.02	3 —	65.40	304	30.284	62	22.55	100
16.0	9.598	107	44.41	237	52.647	99	73.07	79	52.23	21	62.38	302	30.380	96	21.75	80
25.9	9.762	164	42.29	212	52.780	133	72.08	99	52.66	43	59.50	288	30.511	131	21.20	55
Oct. 5.9	9.982	220	40.50	179	52.948	168	70.85	123	53.33	67	56.86	264	30.681	170	20.97	23 —
15.9	10.259	277	39.11	139	53.152	204	69.42	143	54.19	86	54.59	227	30.888	207	21.07	10
25.9	10.588	329	38.22	89	53.389	237	67.77	165	55.23	104	52.78	181	31.131	243	21.55	48
Nov. 4.8	10.962	374	37.87	35 —	53.661	272	65.94	183	56.43	120	51.53	125	31.409	278	22.42	87
14.8	11.372	410	38.11	24	53.961	300	63.97	197	57.73	130	50.89	64 —	31.715	306	23.67	125
24.8	11.807	435	38.94	83	54.282	321	61.90	207	59.11	138	50.91	2	32.041	326	25.29	162
Dec. 4.7	12.253	446	40.36	142	54.618	336	59.80	210	60.51	140	51.56	65	32.380	339	27.21	192
14.7	12.696	443	42.33	197	54.958	340	57.73	207	61.87	136	52.91	135	32.723	343	29.42	221
24.7	13.123	427	44.76	243	55.293	335	55.74	199	63.16	129	54.85	194	33.057	334	31.80	238
34.7	13.519	396	47.61	285	55.611	318	53.91	183	64.32	116	57.31	246	33.374	317	34.31	251
Mean Place	9.184		34.92		50.630		83.67		60.424		49.65		28.732		12.88	
Sec δ, Tan δ	1.524		−1.149		1.019		+0.194		5.817		−5.729		1.039		−0.282	
$D_\psi \alpha$, $D'_\omega \alpha$	+0.05		−0.07		+0.06		+0.01		+0.01		−0.36		+0.06		−0.02	
$D_\psi \delta$, $D_\omega \delta$	−0.4		+0.3		−0.4		+0.3		−0.4		+0.3		−0.4		+0.3	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	46 Leonis Minoris. Mag. 3.9				54 Leonis. Mag. 4.5				ι Antliæ. Mag. 4.7				Groombridge 1706. Mag. 6.3			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 10 48		° ′ +34 39		h m 10 51		° ′ +25 11		h m 10 52		° ′ −36 41		h m 10 53		° ′ +78 12	
	s		″		s		″		s		″		s		″	
Jan. 0.7	38.986		50.14		5.759		40.52		49.535		3.22		22.19		51.91	
10.6	39.338	352	49.33	81	6.090	331	39.33	119	49.872	337	6.13	291	23.30	111	52.67	76
20.6	39.656	318	48.95	38 —	6.386	296	38.48	85	50.170	298	9.24	311	24.30	100	54.02	135
30.6	39.929	273	48.98	3	6.642	256	38.00	48	50.422	252	12.43	319	25.16	86	55.89	187
Feb. 9.6	40.151	222	49.40	42	6.850	208	37.91	9 —	50.624	202	15.64	321	25.82	66	58.20	231
19.5	40.317	166	50.18	78	7.008	158	38.14	23	50.772	148	18.79	315	26.30	48	60.85	265
29.5	40.426	109	51.26	108	7.113	105	38.65	51	50.864	92	21.81	302	26.57	27	63.73	288
Mar. 10.5	40.480	54	52.55	129	7.168	55	39.44	79	50.907	43 —	24.61	280	26.62	5 —	66.70	297
20.5	40.481	1 —	53.99	144	7.176	8 —	40.38	94	50.904	3	27.17	256	26.47	15	69.65	295
30.4	40.437	44	55.51	152	7.142	34	41.46	108	50.860	44	29.47	230	26.12	35	72.46	281
Apr. 9.4	40.355	82	57.02	151	7.076	66	42.60	114	50.780	80	31.43	196	25.60	52	75.01	255
19.4	40.242	113	58.46	144	6.982	94	43.73	113	50.673	107	33.05	162	24.94	66	77.20	219
29.3	40.109	133	59.76	130	6.871	111	44.80	107	50.546	127	34.31	126	24.15	79	78.96	176
May 9.3	39.963	146	60.87	111	6.747	124	45.76	96	50.403	143	35.21	90	23.30	85	80.24	128
19.3	39.811	152	61.76	89	6.620	127	46.59	83	50.251	152	35.72	51	22.39	91	80.98	74
29.3	39.661	150	62.38	62	6.492	128	47.26	67	50.095	156	35.84	12 —	21.47	92	81.17	19 —
June 8.2	39.516	145	62.72	34	6.370	122	47.72	46	49.940	155	35.59	25	20.56	91	80.80	37
18.2	39.384	132	62.79	7 —	6.258	112	48.00	28	49.791	149	34.97	62	19.69	87	79.87	93
28.2	39.267	117	62.56	23	6.159	99	48.06	6 —	49.651	140	34.01	96	18.90	79	78.44	143
July 8.2	39.169	98	62.06	50	6.077	82	47.90	16	49.526	125	32.73	128	18.18	72	76.52	192
18.1	39.094	75	61.27	79	6.013	64	47.53	37	49.419	107	31.16	157	17.57	61	74.17	235
28.1	39.042	52	60.23	104	5.970	43	46.95	58	49.334	85	29.39	177	17.08	49	71.43	274
Aug. 7.1	39.018	24 —	58.93	130	5.950	20 —	46.15	80	49.275	59	27.44	195	16.72	36	68.36	307
17.0	39.022	4	57.39	154	5.955	5	45.15	100	49.248	27 —	25.40	204	16.49	23	65.04	332
27.0	39.058	36	55.64	175	5.989	34	43.93	122	49.255	7	23.32	208	16.41	8 —	61.51	353
Sept. 6.0	39.127	69	53.69	195	6.053	64	42.52	141	49.302	47	21.31	201	16.48	7	57.86	365
16.0	39.234	107	51.55	214	6.151	98	40.90	162	49.392	90	19.44	187	16.70	22	54.1	370
25.9	39.377	143	49.27	228	6.283	132	39.10	180	49.528	136	17.81	163	17.07	37	50.47	369
Oct. 5.9	39.562	185	46.88	239	6.454	171	37.15	195	49.710	182	16.50	131	17.60	53	46.88	359
15.9	39.787	225	44.41	247	6.661	207	35.04	211	49.939	229	15.57	93	18.28	68	43.46	342
25.9	40.052	265	41.90	251	6.906	245	32.84	220	50.213	274	15.09	48 —	19.09	81	40.28	318
Nov. 4.8	40.355	303	39.42	248	7.188	282	30.57	227	50.526	313	15.13	4	20.03	94	37.45	283
14.8	40.689	334	37.02	240	7.500	312	28.29	228	50.874	348	15.67	54	21.08	105	35.02	243
*24.8	41.051	362	34.76	226	7.838	338	26.07	222	51.246	372	16.73	106	22.22	114	33.06	196
Dec. 4.7	41.431	380	32.71	205	8.192	351	23.95	212	51.631	385	18.30	157	23.41	119	31.65	141
14.7	41.817	386	30.97	174	8.553	361	22.03	192	52.018	387	20.32	202	24.63	122	30.81	84
24.7	42.200	383	29.53	144	8.910	357	20.34	169	52.396	378	22.75	243	25.83	120	30.58	23 —
34.7	42.565	365	28.49	104	9.252	342	18.95	139	52.752	356	25.49	274	26.99	116	30.99	41
Mean Place	37.110		65.07		4.066		53.08		48.311		9.55		16.364		73.78	
Sec δ, Tan δ	1.216		+0.692		1.105		+0.470		1.247		−0.745		4.896		+4.793	
$D_\psi \alpha$, $D_\omega \alpha$	+0.07		+0.04		+0.07		+0.03		+0.06		−0.05		+0.10		+0.31	
$D_\psi \delta$, $D_\omega \delta$	−0.4		+0.3		−0.4		+0.3		−0.4		+0.3		−0.4		+0.3	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Crateris. Mag. 4.2				d Leonis. Mag. 5.0				β Ursæ Majoris. Mag. 2.4				α Ursæ Majori Mag. 2.0		
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declin tion
	h m 10 55		° ′ −17 51		h m 10 56		° ′ + 4 3		h m 10 56		° ′ +56 49		h m 10 58		° +62
	s		″		s		″		s		″		s		″
Jan. 0.7	42.098		4.39		14.806		61.04		49.492		38.65		36.26		56.25
		309		259		306		200		486		0		56	
10.7	42.407		6.98		15.112		59.04		49.978		38.65		36.82		56.42
		276		260		277		180		441		54		50	
20.6	42.683		9.58		15.389		57.24		50.419		39.19		37.32		57.15
		236		256		239		157		380		105		43	
30.6	42.919		12.14		15.628		55.67		50.799		40.24		37.75		58.41
		191		245		196		133		310		150		35	
Feb. 9.6	43.110		14.59		15.824		54.34		51.109		41.74		38.10		60.12
		144		228		149		103		230		188		26	
19.5	43.254		16.87		15.973		53.31		51.339		43.62		38.36		62.22
		96		206		102		80		147		217		16	
29.5	43.350		18.93		16.075		52.51		51.486		45.79		38.52		64.59
		52		185		58		52		65		236		7	
Mar. 10.5	43.402		20.78		16.133		51.99		51.551	—	48.15		38.59	—	67.16
		10		157		16		27		14		243		2	
20.5	43.412	—	22.35		16.149	—	51.72		51.537		50.58		38.57		69.77
		25		131		20		8		85		241		12	
30.4	43.387		23.66		16.129		51.64	—	51.452		52.99		38.45		72.31
		55		104		48		11		146		228		18	
Apr. 9.4	43.332		24.70		16.081		51.75		51.306		55.27		38.27		74.71
		79		77		73		27		198		203		24	
19.4	43.253		25.47		16.008		52.02		51.108		57.30		38.03		76.85
		97		51		89		37		235		175		29	
29.4	43.156		25.98		15.919		52.39		50.873		59.05		37.74		78.66
		107		24		100		46		262		140		32	
May 9.3	43.049		26.22		15.819		52.85		50.611		60.45		37.42		80.08
		113		0		104		52		275		99		34	
19.3	42.936		26.22		15.715		53.37		50.336		61.44		37.08		81.05
		115		24		105		55		278		55		34	
29.3	42.821		25.98		15.610		53.92		50.058		61.99		36.74		81.56
		114		46		102		57		272		10		34	
June 8.2	42.707		25.52		15.508		54.49		49.786		62.09	—	36.40		81.58
		107		68		95		57		255		36		32	
18.2	42.600		24.84		15.413		55.06		49.531		61.73		36.08		81.12
		99		86		84		56		234		79		30	
28.2	42.501		23.98		15.329		55.62		49.297		60.94		35.78		80.19
		86		103		71		52		204		121		26	
July 8.2	42.415		22.95		15.258		56.14		49.093		59.73		35.52		78.81
		72		116		58		46		169		162		22	
18.1	42.343		21.79		15.200		56.60		48.924		58.11		35.30		77.02
		54		125		40		39		131		196		17	
28.1	42.289		20.54		15.160		56.99		48.793		56.15		35.13		74.85
		34		129		19		28		88		229		12	
Aug. 7.1	42.255		19.25		15.141	—	57.27		48.705		53.86		35.01		72.34
		8		128		1		17		43		258		7	
17.1	42.247	—	17.97		15.142		57.44		48.662	—	51.28		34.94		69.56
		18		122		28		2		7		281		0	
27.0	42.265		16.75		15.170		57.46	—	48.669		48.47		34.94		66.53
		50		111		56		18		60		300		5	
Sept. 6.0	42.315		15.64		15.226		57.28		48.729		45.47		34.99		63.34
		84		91		86		37		114		313		11	
16.0	42.399		14.73		15.312		56.91		48.843		42.34		35.10		60.02
		122		67		121		61		172		320		19	
25.9	42.521		14.06		15.433		56.30		49.015		39.14		35.29		56.64
		159		36		155		84		230		323		25	
Oct. 5.9	42.680		13.70		15.588		55.46		49.245		35.91		35.54		53.27
		199		3		191		112		289		318		32	
15.9	42.879		13.67	—	15.779		54.34		49.534		32.73		35.86		49.97
		237		35		228		136		345		305		40	
25.9	43.116		14.02		16.007		52.98		49.879		29.68		36.26		46.82
		271		75		262		161		399		287		45	
Nov. 4.8	43.387		14.77		16.269		51.37		50.278		26.81		36.71		43.90
		304		115		290		181		447		261		50	
14.8	43.691		15.92		16.559		49.56		50.725		24.20		37.21		41.28
		326		153		315		198		486		226		55	
24.8	44.017		17.45		16.874		47.58		51.211		21.94		37.76		39.04
		341		187		331		211		511		186		58	
Dec. 4.8	44.358		19.32		17.205		45.47		51.722		20.08		38.34		37.24
		346		215		336		215		526		139		59	
14.7	44.704		21.47		17.541		43.32		52.248		18.69		38.93		35.94
		338		238		333		213		523		88		60	
24.7	45.042		23.85		17.874		41.19		52.771		17.81		39.53		35.19
		323		251		317		205		503		33		57	
34.7	45.365		26.36		18.191		39.14		53.274		17.48		40.10		35.01
Mean Place	40.816		5.11		13.381		67.38		46.955		58.62		33.405		77.10
Sec δ, Tan δ	1.050		−0.322		1.003		+0.071		1.828		+1.530		2.144		+1.89
*D*ψ *α*, *D*ω *α*	*+0.06*		−0.02		+0.06		0.00		+0.07		+0.10		+0.07		+0.12
*D*ψ *δ*, *D*ω *δ*	*−0.4*		+0.3		−0.4		+0.3		−0.4		+0.3		−0.4		+0.3

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	χ Leonis. Mag. 4.7				p^4 Leonis. Mag. 5.7				ψ Ursæ Majoris. Mag. 3.2				β Crateris. Mag. 4.5			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 11 0		° ′ + 7 46		h m 11 2		° ′ + 2 24		h m 11 4		° ′ +44 56		h m 11 7		° ′ −22 21	
	s		″		s		″		s		″		s		″	
Jan. 0.7	42.543	310	78.12	188	38.562	311	36.77	207	58.847	403	58.12	55	32.673	321	59.82	264
10.7	42.853	282	76.24	165	38.873	277	34.70	187	59.250	368	57.57	5	32.994	290	62.46	271
20.6	43.135	243	74.59	142	39.150	242	32.83	167	59.618	321	57.52	— 44	33.284	250	65.17	271
30.6	43.378	201	73.17	112	39.392	198	31.16	143	59.939	265	57.96	89	33.534	206	67.88	264
Feb. 9.6	43.579	154	72.05	83	39.590	154	29.73	116	60.204	203	58.85	128	33.740	158	70.52	250
19.5	43.733	107	71.22	56	39.744	107	28.57	91	60.407	138	60.13	160	33.898	111	73.02	233
29.5	43.840	62	70.66	29	39.851	62	27.66	63	60.545	74	61.73	182	34.009	65	75.35	209
Mar. 10.5	43.902	20	70.37	6	39.913	24	27.03	38	60.619	13	63.55	198	34.074	22	77.44	186
20.5	43.922	— 17	70.31	— 14	39.937	— 15	26.65	15	60.632	— 42	65.53	202	34.096	— 14	79.30	158
30.4	43.905	46	70.45	32	39.922	44	26.50	— 1	60.590	89	67.55	198	34.082	45	80.88	132
Apr. 9.4	43.859	71	70.77	43	39.878	67	26.51	19	60.501	128	69.53	185	34.037	72	82.20	102
19.4	43.788	88	71.20	52	39.811	85	26.70	33	60.373	157	71.38	164	33.965	90	83.22	74
29.4	43.700	99	71.72	57	39.726	96	27.03	39	60.216	177	73.02	138	33.875	103	83.96	47
May 9.3	43.601	106	72.29	60	39.630	102	27.42	50	60.039	187	74.40	108	33.772	113	84.43	17
19.3	43.495	106	72.89	60	39.528	105	27.92	55	59.852	191	75.48	72	33.659	118	84.60	— 9
29.3	43.389	103	73.49	58	39.423	101	28.47	58	59.661	187	76.20	37	33.541	116	84.51	35
June 8.2	43.286	97	74.07	54	39.322	96	29.05	58	59.474	177	76.57	0	33.425	114	84.16	61
18.2	43.189	87	74.61	49	39.226	86	29.63	59	59.297	161	76.57	38	33.311	106	83.55	83
28.2	43.102	74	75.10	42	39.140	76	30.22	55	59.136	143	76.19	75	33.205	97	82.72	103
July 8.2	43.028	61	75.52	33	39.064	62	30.77	51	58.993	117	75.44	110	33.108	84	81.69	119
18.1	42.967	44	75.85	22	39.002	46	31.28	46	58.876	92	74.34	142	33.024	66	80.50	134
28.1	42.923	23	76.07	11	38.956	26	31.74	36	58.784	61	72.92	174	32.958	47	79.16	141
Aug. 7.1	42.900	3	76.18	— 4	38.930	5	32.10	25	58.723	28	71.18	202	32.911	22	77.75	144
17.1	42.897	— 24	76.14	22	38.925	— 21	32.35	9	58.695	— 8	69.16	225	32.889	— 4	76.31	142
27.0	42.921	50	75.92	39	38.946	47	32.44	— 6	58.703	45	66.91	247	32.893	38	74.89	132
Sept. 6.0	42.971	82	75.53	60	38.993	81	32.38	27	58.748	89	64.44	265	32.931	73	73.57	115
16.0	43.053	116	74.93	82	39.074	111	32.11	53	58.837	133	61.79	278	33.004	112	72.42	93
25.9	43.169	151	74.11	107	39.185	152	31.58	77	58.970	180	59.01	287	33.116	152	71.49	63
Oct. 5.9	43.320	187	73.04	130	39.337	185	30.81	103	59.150	228	56.14	291	33.268	194	70.86	29
15.9	43.507	225	71.74	149	39.522	223	29.78	128	59.378	275	53.23	288	33.462	234	70.57	— 10
25.9	43.732	259	70.25	174	39.745	254	28.50	155	59.653	319	50.35	279	33.696	272	70.67	52
Nov. 4.8	43.991	289	68.51	192	39.999	289	26.95	179	59.972	360	47.56	263	33.968	306	71.19	93
14.8	44.280	314	66.59	205	40.288	313	25.16	195	60.332	393	44.93	240	34.274	330	72.12	136
24.8	44.594	331	64.54	218	40.601	327	23.21	209	60.725	417	42.53	210	34.604	348	73.48	173
Dec. 4.8	44.925	338	62.36	214	40.928	336	21.12	217	61.142	429	40.43	172	34.952	354	75.21	208
14.7	45.263	335	60.22	208	41.264	334	18.95	217	61.571	430	38.71	130	35.306	349	77.29	233
24.7	45.598	321	58.14	197	41.598	320	16.78	212	62.001	415	37.41	83	35.655	334	79.62	255
34.7	45.919		56.17		41.918		14.66		62.416		36.58		35.989		82.17	
Mean Place	41.109		85.80		37.184		42.76		56.853		76.31		31.477		61.77	
Sec δ, Tan δ	1.009		+0.137		1.001		+0.042		1.413		+0.998		1.081		−0.412	
$D_\psi \alpha$, $D_\omega \alpha$	+0.06		+0.01		+0.06		0.00		+0.07		+0.06		+0.06		−0.03	
$D_\psi \delta$, $D_\omega \delta$	−0.4		+0.3		−0.4		+0.2		−0.4		+0.2		−0.4		+0.2	

Washington Mean Time.	δ Leonis. Mag. 2.6				θ Leonis. Mag. 3.4				ν Ursæ Majoris. Mag. 3.7				δ Crateris. Mag. 3.8			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	11 9		+20 58		11 9		+15 52		11 13		+38 32		11 15		−14 19	
	s		″		s		″		s		″		s		″	
Jan. 0.7	40.149	331	50.59	147	51.470	324	69.40	164	58.421	361	54.47	104	9.575	317	26.50	246
10.7	40.480	302	49.12	113	51.794	294	67.76	135	58.782	332	53.43	61	9.892	289	28.96	246
20.6	40.782	264	47.99	78	52.088	258	66.41	104	59.114	291	52.82	18	10.181	252	31.42	239
30.6	41.046	221	47.21	43	52.346	215	65.37	70	59.405	244	52.64	— 25	10.433	209	33.81	227
Feb. 9.6	41.267	172	46.78	7	52.561	168	64.67	37	59.649	191	52.89	63	10.642	165	36.08	208
19.6	41.439	123	46.71	— 24	52.729	120	64.30	7	59.840	135	53.52	97	10.807	118	38.16	188
29.5	41.562	74	46.95	50	52.849	73	64.23	— 20	59.975	82	54.49	124	10.925	75	40.04	164
Mar. 10.5	41.636	29	47.45	74	52.922	30	64.43	43	60.057	30	55.73	143	11.000	33	41.68	139
20.5	41.665	— 12	48.19	89	52.952	— 10	64.86	61	60.087	— 16	57.16	154	11.033	— 3	43.07	113
30.4	41.653	45	49.08	99	52.942	42	65.47	75	60.071	56	58.70	159	11.030	34	44.20	89
Apr. 9.4	41.608	73	50.07	103	52.900	68	66.22	82	60.015	88	60.29	154	10.996	58	45.09	63
19.4	41.535	93	51.10	102	52.832	87	67.04	84	59.927	113	61.83	145	10.938	79	45.72	41
29.4	41.442	106	52.12	97	52.745	101	67.88	83	59.814	130	63.28	127	10.859	91	46.13	17
May 9.3	41.336	115	53.09	87	52.644	108	68.71	79	59.684	141	64.55	108	10.768	101	46.30	— 4
19.3	41.221	117	53.96	74	52.536	111	69.50	69	59.543	144	65.63	83	10.667	105	46.26	25
29.3	41.104	115	54.70	59	52.425	109	70.19	60	59.399	142	66.46	56	10.562	106	46.01	43
June 8.3	40.989	109	55.29	43	52.316	102	70.79	49	59.257	136	67.02	27	10.456	103	45.58	61
18.2	40.880	99	55.72	23	52.214	95	71.28	35	59.121	126	67.29	— 1	10.353	97	44.97	76
28.2	40.781	87	55.95	6	52.119	83	71.63	20	58.995	110	67.28	31	10.256	89	44.21	89
July 8.2	40.694	72	56.01	— 15	52.036	67	71.83	4	58.885	95	66.97	61	10.167	78	43.32	99
18.1	40.622	54	55.86	35	51.969	52	71.87	— 11	58.790	73	66.36	88	10.089	61	42.33	106
28.1	40.566	35	55.51	55	51.917	33	71.76	30	58.717	51	65.48	116	10.028	44	41.27	109
Aug. 7.1	40.533	11	54.96	76	51.884	10	71.46	48	58.666	24	64.32	140	9.984	22	40.18	108
17.1	40.522	— 15	54.20	97	51.874	— 15	70.98	68	58.642	— 4	62.92	167	9.962	— 2	39.10	101
27.0	40.537	42	53.23	119	51.889	42	70.30	88	58.646	37	61.25	188	9.964	33	38.09	89
Sept. 6.0	40.579	76	52.04	138	51.931	74	69.42	110	58.683	73	59.37	209	9.997	66	37.20	71
16.0	40.655	111	50.66	160	52.005	109	68.32	130	58.756	111	57.28	226	10.063	102	36.49	49
26.0	40.766	148	49.06	179	52.114	145	67.02	151	58.867	151	55.02	242	10.165	139	36.00	20
Oct. 5.9	40.914	185	47.27	197	52.259	182	65.51	173	59.018	194	52.60	253	10.304	180	35.80	— 11
15.9	41.099	226	45.30	211	52.441	220	63.78	189	59.212	236	50.07	260	10.484	220	35.91	45
25.9	41.325	262	43.19	222	52.661	257	61.89	206	59.448	277	47.47	260	10.704	257	36.36	83
Nov. 4.8	41.587	295	40.97	228	52.918	289	59.83	215	59.725	314	44.87	254	10.961	290	37.19	119
14.8	41.882	322	38.69	228	53.207	317	57.68	221	60.039	346	42.33	244	11.251	317	38.38	154
24.8	42.204	343	36.41	222	53.524	335	55.47	220	60.385	367	39.89	224	11.568	335	39.92	183
Dec. 4.8	42.547	353	34.19	208	53.859	345	53.27	212	60.752	380	37.65	198	11.903	343	41.75	210
14.7	42.900	351	32.11	190	54.204	344	51.15	199	61.132	382	35.67	165	12.246	341	43.85	229
24.7	43.251	341	30.21	163	54.548	333	49.16	178	61.514	371	34.02	128	12.587	329	46.14	240
34.7	43.592		28.58		54.881		47.38		61.885		32.74		12.916		48.54	
Mean Place	38.629		62.71		50.010		79.97		56.750		70.36		8.378		25.72	
Sec δ, Tan δ	1.071		+0.383		1.039		+0.285		1.200		+0.663		1.032		−0.255	
$D_\psi a$, $D_\omega a$	+0.06		+0.02		+0.06		+0.02		+0.06		+0.04		+0.06		−0.02	
$D_\psi \delta$, $D_\omega \delta$	−0.4		+0.2		−0.4		+0.2		−0.4		+0.2		−0.4		+0.2	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	σ Leonis. Mag. 4.1				π Centauri. Mag. 4.3				ι Leonis. Mag. 4.0				τ Leonis. Mag. 5.2			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 11 16		° ′ + 6 28		h m 11 17		° ′ −54 1		h m 11 19		° ′ +10 58		h m 11 23		° ′ + 3 18	
	s		″		s		″		s		″		s		″	
Jan. 0.7	49.697	316	76.02	195	11.296	439	39.43	277	34.115	323	82.16	183	38.336	319	61.56	205
10.7	50.013	291	74.07	175	11.735	394	42.20	313	34.438	295	80.33	158	38.655	292	59.51	188
20.6	50.304	255	72.32	151	12.129	338	45.33	337	34.733	260	78.75	130	38.947	259	57.63	166
30.6	50.559	214	70.81	123	12.467	274	48.70	354	34.993	220	77.45	101	39.206	219	55.97	142
Feb. 9.6	50.773	170	69.58	95	12.741	209	52.24	361	35.213	175	76.44	69	39.425	175	54.55	113
19.6	50.943	123	68.63	64	12.950	141	55.85	360	35.388	128	75.75	39	39.600	129	53.42	86
29.5	51.066	79	67.99	39	13.091	77	59.45	349	35.516	83	75.36	10	39.729	85	52.56	57
Mar. 10.5	51.145	36	67.60	12	13.168	15	62.94	333	35.599	41	75.26	— 15	39.814	46	51.99	33
20.5	51.181	1	67.48	— 8	13.183	— 41	66.27	309	35.640	2	75.41	34	39.860	7	51.66	11
30.4	51.182	— 32	67.56	26	13.142	90	69.36	281	35.642	— 30	75.75	49	39.867	— 25	51.55	— 9
Apr. 9.4	51.150	57	67.82	40	13.052	133	72.17	248	35.612	56	76.24	62	39.842	50	51.64	26
19.4	51.093	76	68.22	49	12.919	170	74.65	209	35.556	77	76.86	68	39.792	70	51.90	37
29.4	51.017	90	68.71	57	12.749	196	76.74	169	35.479	90	77.54	73	39.722	84	52.27	47
May 9.3	50.927	98	69.28	60	12.555	219	78.43	124	35.389	100	78.27	70	39.638	94	52.74	54
19.3	50.829	101	69.88	62	12.334	234	79.67	78	35.289	103	78.97	69	39.544	98	53.28	58
29.3	50.728	101	70.50	60	12.100	242	80.45	31	35.186	103	79.66	63	39.446	99	53.86	59
June 8.3	50.627	97	71.10	58	11.858	244	80.76	— 16	35.083	100	80.29	56	39.347	97	54.45	59
18.2	50.530	91	71.68	53	11.614	239	80.60	62	34.983	93	80.85	46	39.250	91	55.04	58
28.2	50.439	81	72.21	47	11.375	228	79.98	107	34.890	83	81.31	36	39.159	83	55.62	54
July 8.2	50.358	68	72.68	38	11.147	208	78.91	148	34.807	70	81.67	22	39.076	70	56.16	49
18.1	50.290	54	73.06	28	10.939	182	77.43	183	34.737	56	81.89	10	39.006	58	56.65	41
28.1	50.236	37	73.34	17	10.757	148	75.60	215	34.681	39	81.99	— 5	38.948	43	57.06	31
Aug. 7.1	50.199	16	73.51	3	10.609	107	73.45	238	34.642	18	81.94	22	38.905	22	57.37	18
17.1	50.183	— 7	73.54	— 14	10.502	58	71.07	252	34.624	— 5	81.72	39	38.883	— 1	57.55	5
27.0	50.190	36	73.40	33	10.444	1	68.55	259	34.629	34	81.33	59	38.884	29	57.60	— 15
Sept. 6.0	50.226	66	73.07	52	10.443	— 58	65.96	255	34.663	64	80.74	81	38.913	50	57.45	34
16.0	50.292	99	72.55	76	10.501	123	63.41	240	34.727	96	79.93	102	38.972	92	57.11	56
26.0	50.391	135	71.79	100	10.624	192	61.01	214	34.823	134	78.91	127	39.064	129	56.55	82
Oct. 5.9	50.526	174	70.79	124	10.816	257	58.87	180	34.957	173	77.64	148	39.193	167	55.73	108
15.9	50.700	212	69.55	148	11.073	321	57.07	136	35.130	212	76.16	170	39.360	206	54.65	133
25.9	50.912	248	68.07	171	11.394	380	55.71	85	35.342	247	74.46	188	39.566	243	53.32	158
Nov. 4.8	51.160	280	66.36	190	11.774	428	54.86	29	35.589	280	72.58	204	39.809	276	51.74	179
14.8	51.440	308	64.46	205	12.202	463	54.57	— 30	35.869	309	70.54	215	40.085	305	49.95	198
24.8	51.748	327	62.41	215	12.665	487	54.87	91	36.178	328	68.39	220	40.390	324	47.97	212
Dec. 4.8	52.075	337	60.26	218	13.152	493	55.78	148	36.506	340	66.19	217	40.714	336	45.85	217
14.7	52.412	337	58.08	213	13.645	485	57.26	202	36.846	341	64.02	209	41.050	333	43.68	219
24.7	52.749	327	55.95	203	14.130	461	59.28	249	37.187	331	61.93	194	41.383	331	41.49	210
34.7	53.076		53.92		14.591		61.77		37.518		59.99		41.714		39.39	
Mean Place	48.365		83.80		10.273		49.95		32.763		91.49		37.070		68.48	
Sec δ, Tan δ	1.006		+0.114		1.702		−1.378		1.019		+0.194		1.002		+0.058	
$D_\psi a$, $D_\omega a$	+0.06		+0.01		+0.05		−0.09		+0.06		+0.01		+0.06		0.00	
$D_\psi \delta$, $D_\omega \delta$	−0.4		+0.2		−0.4		+0.2		−0.4		+0.2		−0.4		+0.2	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	λ Draconis. Mag. 4.1				ξ Hydræ. Mag. 3.7				λ Centauri. Mag. 3.3				υ Leonis. Mag. 4.5			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 11 26		° ′ +69 46		h m 11 28		° ′ −31 23		h m 11 31		° ′ −62 33		h m 11 32		° ′ − 0 21	
	s		″		s		″		s		″		s		″	
Jan. 0.7	29.13	73	78.12	8	53.092	348	29.65	264	54.76	54	5.80	256	40.059	321	41.39	214
10.7	29.86	68	78.20	68	53.440	319	32.29	281	55.30	50	8.36	297	40.380	296	43.53	202
20.6	30.54	60	78.88	126	53.759	280	35.10	290	55.80	43	11.33	330	40.676	264	45.55	183
30.6	31.14	51	80.14	178	54.039	236	38.00	292	56.23	34	14.63	355	40.940	225	47.38	160
Feb. 9.6	31.65	38	81.92	221	54.275	187	40.92	286	56.57	28	18.18	369	41.165	182	48.98	135
19.6	32.03	27	84.13	255	54.462	137	43.78	275	56.85	20	21.87	375	41.347	137	50.33	107
29.5	32.30	15	86.68	275	54.599	90	46.53	257	57.05	11	25.62	372	41.484	95	51.40	81
Mar. 10.5	32.45	1	89.43	286	54.689	47	49.10	236	57.16	4	29.34	361	41.579	53	52.21	56
20.5	32.46	10	92.29	284	54.736	5	51.46	210	57.20	3	32.95	342	41.632	16	52.77	31
30.5	32.36	20	95.13	270	54.741	31	53.56	184	57.17	11	36.37	317	41.648	15	53.08	11
Apr. 9.4	32.16	29	97.83	245	54.710	59	55.40	153	57.06	16	39.54	286	41.633	41	53.19	7
19.4	31.87	38	100.28	212	54.651	83	56.93	123	56.90	20	42.40	251	41.592	62	53.12	23
29.4	31.49	43	102.40	171	54.568	102	58.16	91	56.70	25	44.91	209	41.530	78	52.89	34
May 9.3	31.06	47	104.11	126	54.466	117	59.07	57	56.45	28	47.00	165	41.452	88	52.55	44
19.3	30.59	50	105.37	76	54.349	125	59.64	26	56.17	31	48.65	118	41.364	94	52.11	51
29.3	30.09	50	106.13	23	54.224	130	59.90	8	55.86	33	49.83	68	41.270	97	51.60	57
June 8.3	29.59	50	106.36	29	54.094	132	59.82	38	55.53	34	50.51	18	41.173	96	51.03	60
18.2	29.09	47	106.07	81	53.962	129	59.44	70	55.19	33	50.69	33	41.077	93	50.43	61
28.2	28.62	43	105.26	131	53.833	123	58.74	98	54.86	33	50.36	81	40.984	86	49.82	62
July 8.2	28.19	39	103.95	177	53.710	111	57.76	123	54.53	31	49.55	129	40.898	76	49.20	58
18.2	27.80	33	102.18	221	53.599	96	56.53	144	54.22	27	48.26	172	40.822	64	48.62	55
28.1	27.47	27	99.97	259	53.503	77	55.09	161	53.95	24	46.54	209	40.758	49	48.07	47
Aug. 7.1	27.20	20	97.38	292	53.426	55	53.48	171	53.71	18	44.45	239	40.709	29	47.60	37
17.1	27.00	12	94.46	319	53.371	25	51.77	176	53.53	13	42.06	262	40.680	9	47.23	24
27.0	26.88	3	91.27	340	53.346	11	50.01	172	53.40	4	39.44	275	40.671	20	46.99	8
Sept. 6.0	26.85	5	87.87	357	53.357	48	48.29	161	53.36	3	36.69	277	40.691	48	46.91	12
16.0	26.90	14	84.30	363	53.405	92	46.68	143	53.39	11	33.92	269	40.739	84	47.03	35
26.0	27.04	23	80.67	366	53.497	137	45.25	116	53.50	19	31.23	249	40.823	120	47.38	60
Oct. 5.9	27.27	33	77.01	357	53.634	184	44.09	84	53.69	29	28.74	218	40.943	160	47.98	86
15.9	27.60	42	73.44	344	53.818	230	43.25	43	53.98	36	26.56	178	41.103	199	48.84	114
25.9	28.02	51	70.00	320	54.048	274	42.82	1	54.34	45	24.78	130	41.302	236	49.98	141
Nov. 4.9	28.53	59	66.80	290	54.322	313	42.81	46	54.79	52	23.48	74	41.538	272	51.39	167
14.8	29.12	66	63.90	249	54.635	343	43.27	93	55.31	55	22.74	14	41.810	301	53.06	188
24.8	29.78	71	61.41	203	54.978	365	44.20	139	55.86	59	22.60	49	42.111	322	54.94	207
Dec. 4.8	30.49	75	59.38	150	55.343	375	45.59	181	56.45	60	23.09	110	42.433	336	57.01	216
14.7	31.24	76	57.88	90	55.718	374	47.40	217	57.05	60	24.19	169	42.769	337	59.17	220
24.7	32.00	74	56.98	30	56.092	361	49.57	248	57.65	57	25.88	223	43.106	329	61.37	219
34.7	32.74		56.68		56.453		52.05		58.22		28.11		43.435		63.56	
Mean Place	26.035		101.40		52.058		34.10		53.892		17.95		38.870		35.47	
Sec δ, Tan δ	2.895		+2.717		1.172		−0.610		2.170		−1.926		1.000		−0.006	
$D_\psi a$, $D_\omega a$	+0.07		+0.18		+0.06		−0.04		+0.05		−0.13		+0.06		0.00	
$D_\psi \delta$, $D_\omega \delta$	−0.4		+0.1		−0.4		+0.1		−0.4		+0.1		−0.4		+0.1	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	π Chamæleontis. Mag. 5.7				3 Draconis. Mag. 5.5				ζ Crateris. Mag. 4.9				χ Ursæ Majoris. Mag. 3.8			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 11 33		° ′ −75 25		h m 11 37		° ′ +67 11		h m 11 40		° ′ −17 53		h m 11 41		° ′ +48 14	
	s		″		s		″		s		″		s		″	
Jan. 0.7	48.02	90	39.52	232	50.65	67	71.94	16	31.228	334	1.37	245	39.001	435	22.08	81
10.7	48.92	81	41.84	284	51.32	62	71.78	— 48	31.562	308	3.82	250	39.436	408	21.27	26
20.7	49.73	70	44.68	324	51.94	56	72.26	104	31.870	274	6.32	246	39.844	368	21.01	— 28
30.6	50.43	58	47.92	355	52.50	47	73.30	159	32.144	234	8.78	239	40.212	316	21.29	79
Feb. 9.6	51.01	44	51.47	375	52.97	39	74.89	205	32.378	191	11.17	225	40.528	257	22.08	125
19.6	51.45	30	55.22	389	53.36	27	76.94	241	32.569	147	13.42	207	40.785	191	23.33	164
29.5	51.75	16	59.11	393	53.63	17	79.35	267	32.716	103	15.49	185	40.976	126	24.97	194
Mar. 10.5	51.91	2	63.04	386	53.80	4	82.02	280	32.819	60	17.34	162	41.102	62	26.91	215
20.5	51.93	— 11	66.90	374	53.84	— 5	84.82	282	32.879	24	18.96	136	41.164	0	29.06	225
30.5	51.82	22	70.64	352	53.79	15	87 64	273	32.903	— 9	20.32	111	41.164	54	31.31	227
Apr. 9.4	51.60	34	74.16	324	53.64	24	90.37	251	32.894	36	21.43	88	41.110	100	33.58	216
19.4	51.26	43	77.40	289	53.40	30	92.88	222	32.858	60	22.31	62	41.010	138	35.74	200
29.4	50.83	52	80.29	249	53.10	36	95.10	184	32.798	76	22.93	38	40.872	168	37.74	175
May 9.4	50.31	60	82.78	203	52.74	40	96.94	141	32.722	88	23.31	15	40.704	188	39.49	145
19.3	49.71	65	84.81	155	52.34	43	98.35	93	32.634	98	23.46	— 7	40.516	201	40.94	109
29.3	49.06	68	86.36	103	51.91	43	99.28	43	32.536	102	23.39	29	40.315	206	42.03	70
June 8.3	48.38	71	87.39	48	51.48	44	99.71	— 9	32.434	106	23.10	48	40.109	204	42.73	29
18.2	47.67	71	87.87	— 7	51.04	41	99.62	60	32.328	103	22.62	66	39.905	198	43.02	— 11
28.2	46.96	69	87.80	60	50.63	39	99.02	110	32.225	100	21.96	82	39.707	184	42.91	53
July 8.2	46.27	66	87.20	113	50.24	36	97.92	158	32.125	92	21.14	98	39.523	166	42.38	92
18.2	45.61	59	86.07	161	49.88	31	96.34	201	32.033	80	20.16	106	39.357	145	41.46	132
28.1	45.02	51	84.46	206	49.57	26	94.33	242	31.953	66	19.10	113	39.212	118	40.14	168
Aug. 7.1	44.51	42	82.40	241	49.31	19	91.91	276	31.887	46	17.97	116	39.094	88	38.46	201
17.1	44.09	30	79.99	271	49.12	13	89.15	306	31.841	22	16.81	111	39.006	52	36.45	230
27.1	43.79	16	77.28	290	48.99	6	86.09	330	31.819	— 7	15.70	106	38.954	13	34.15	258
Sept. 6.0	43.63	0	74.38	299	48.93	— 2	82.79	348	31.826	39	14.64	90	38.941	— 31	31.57	279
16.0	43.63	14	71.39	296	48.95	10	79.31	360	31.865	77	13.74	69	38.972	78	28.78	298
26.0	43.77	30	68.43	280	49.05	18	75.71	363	31.942	118	13.05	44	39.050	128	25.80	310
Oct. 5.9	44.07	46	65.63	255	49.23	27	72.08	361	32.060	158	12.61	13	39.178	181	22.70	317
15.9	44.53	62	63.08	217	49.50	36	68.47	348	32.218	203	12.48	— 20	39.359	236	19.53	317
25.9	45.15	75	60.91	171	49.86	44	64.99	330	32.421	244	12.68	56	39.595	288	16.36	309
Nov. 4.9	45.90	85	59.20	115	50.30	52	61.69	301	32.665	280	13.24	96	39.883	336	13.27	296
14.8	46.75	94	58.05	55	50.82	58	58.68	265	32.945	311	14.20	131	40.219	379	10.31	274
24.8	47.69	100	57.50	— 11	51.40	63	56.03	221	33.256	335	15.51	166	40.598	414	7.57	243
Dec. 4.8	48.69	101	57.61	75	52.03	67	53.82	170	33.591	346	17.17	196	41.012	436	5.14	205
14.8	49.70	99	58.36	140	52.70	68	52.12	113	33.937	351	19.13	219	41.448	448	3.09	161
24.7	50.69	94	59.76	198	53.38	68	50.99	52	34.288	340	21.32	236	41.896	441	1.48	112
34.7	51.63		61.74		54.06		50.47		34.628		23.68		42.337		0.36	
Mean Place	47.279		53.52		48.021		95.51		30.191		1.28		37.269		42.70	
Sec δ, Tan δ	3.977		−3.849		2.581		+2.379		1.051		−0.323		1.501		+1.120	
$D_\psi a$, $D_\omega a$	+0.05		−0.25		+0.07		+0.16		+0.06		−0.02		+0.06		+0.07	
$D_\psi \delta$, $D_\omega \delta$	−0.4		+0.1		−0.4		+0.1		−0.4		+0.1		−0.4		+0.1	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Leonis. (*Denebola.*) Mag. 2.2				β Virginis. Mag. 3.8			
	Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 11 44		° ′ +15 1		h m 11 46		° ′ + 2 13	
	s		″		s		″	
Jan. 0.7	47.825	334	78.57	181	20.313	328	70.28	210
10.7	48.159	311	76.76	153	20.641	305	68.18	196
20.7	48.470	281	75.23	120	20.946	276	66.22	174
30.6	48.751	242	74.03	85	21.222	238	64.48	150
Feb. 9.6	48.993	199	73.18	52	21.460	196	62.98	123
19.6	49.192	153	72.66	18	21.656	153	61.75	94
29.6	49.345	108	72.48	— 13	21.809	109	60.81	66
Mar. 10.5	49.453	64	72.61	38	21.918	68	60.15	40
20.5	49.517	25	72.99	60	21.986	31	59.75	16
30.5	49.542	— 10	73.59	77	22.017	0	59.59	— 3
Apr. 9.4	49.532	38	74.36	87	22.017	30	59.62	22
19.4	49.494	63	75.23	92	21.987	50	59.84	35
29.4	49.431	80	76.15	94	21.937	69	60.19	45
May 9.4	49.351	92	77.09	90	21.868	80	60.64	52
19.3	49.259	101	77.99	83	21.788	89	61.16	57
29.3	49.158	104	78.82	73	21.699	93	61.73	60
June 8.3	49.054	105	79.55	61	21.606	94	62.33	61
18.3	48.949	102	80.16	49	21.512	93	62.94	59
28.2	48.847	97	80.65	33	21.419	88	63.53	56
July 8.2	48.750	88	80.98	15	21.331	81	64.09	51
18.2	48.662	75	81.13	— 2	21.250	70	64.60	44
28.1	48.587	61	81.11	21	21.180	57	65.04	35
Aug. 7.1	48.526	43	80.90	39	21.123	40	65.39	22
17.1	48.483	20	80.51	61	21.083	17	65.61	9
27.1	48.463	— 5	79.90	82	21.066	— 6	65.70	— 8
Sept. 6.0	48.468	36	79.08	104	21.072	38	65.62	29
16.0	48.504	70	78.04	128	21.110	71	65.33	51
26.0	48.574	107	76.76	150	21.181	108	64.82	76
Oct. 6.0	48.681	148	75.26	172	21.289	147	64.06	101
15.9	48.829	187	73.54	191	21.436	188	63.05	128
25.9	49.016	227	71.63	210	21.624	227	61.77	153
Nov. 4.9	49.243	266	69.53	221	21.851	264	60.24	176
14.8	49.509	297	67.32	229	22.115	296	58.48	196
24.8	49.806	322	65.03	231	22.411	319	56.52	210
Dec. 4.8	50.128	339	62.72	226	22.730	334	54.42	220
14.8	50.467	344	60.46	212	23.064	339	52.22	220
24.7	50.811	339	58.34	195	23.403	335	50.02	216
34.7	51.150		56.39		23.738		47.86	
Mean Place	46.591		90.04		19.185		77.45	
Sec δ, Tan δ	1.035		+0.269		1.001		+0.039	
$D_\psi a$, $D_\omega a$	+0.06		+0.02		+0.06		0.00	
$D_\psi \delta$, $D_\omega \delta$	−0.4		+0.1		−0.4		+0.1	

Washington Mean Time.	Groombridge 1830. Mag. 6.5				γ Ursæ Majoris. Mag. 2.5			
	Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 11 48		° ′ +38 18		h m 11 49		° ′ +54 8	
	s		″		s		″	
Jan. 0.7	10.019	398	59.37	134	26.990	483	80.37	71
10.7	10.417	374	58.03	84	27.473	455	79.66	12
20.7	10.791	340	57.19	36	27.928	413	79.54	— 44
30.6	11.131	295	56.83	— 13	28.341	358	79.98	99
Feb. 9.6	11.426	246	56.96	56	28.699	293	80.97	146
19.6	11.672	189	57.52	96	28.992	221	82.43	186
29.6	11.861	133	58.48	129	29.213	146	84.29	219
Mar. 10.5	11.994	79	59.77	152	29.359	75	86.48	238
20.5	12.073	28	61.29	170	29.434	4	88.86	248
30.5	12.101	— 18	62.99	175	29.438	— 59	91.34	248
Apr. 9.4	12.083	55	64.74	172	29.379	114	93.82	238
19.4	12.028	89	66.46	164	29.265	160	96.20	216
29.4	11.939	113	68.10	147	29.105	196	98.36	190
May 9.4	11.826	129	69.57	123	28.909	224	100.26	155
19.3	11.697	143	70.80	98	28.685	240	101.81	116
29.3	11.554	146	71.78	65	28.445	248	102.97	73
June 8.3	11.408	147	72.43	33	28.197	249	103.70	29
18.3	11.261	144	72.76	— 1	27.948	243	103.99	— 16
28.2	11.117	133	72.75	36	27.705	230	103.83	62
July 8.2	10.984	122	72.39	71	27.475	210	103.21	105
18.2	10.862	105	71.68	105	27.265	186	102.16	147
28.1	10.757	84	70.63	136	27.079	155	100.69	184
Aug. 7.1	10.673	62	69.27	169	26.924	121	98.85	222
17.1	10.611	32	67.58	198	26.803	82	96.63	253
27.1	10.579	1	65.60	224	26.721	37	94.10	280
Sept. 6.0	10.578	— 36	63.36	248	26.684	— 12	91.30	303
16.0	10.614	76	60.88	269	26.696	66	88.27	320
26.0	10.690	121	58.19	287	26.762	123	85.07	332
Oct. 6.0	10.811	166	55.32	298	26.885	183	81.75	337
15.9	10.977	215	52.34	306	27.068	243	78.38	336
25.9	11.192	261	49.28	306	27.311	303	75.02	326
Nov. 4.9	11.453	306	46.22	301	27.614	359	71.76	307
14.8	11.759	343	43.21	288	27.973	408	68.69	283
24.8	12.102	375	40.33	265	28.381	449	65.86	247
Dec. 4.8	12.477	396	37.68	238	28.830	476	63.39	206
14.8	12.873	405	35.30	200	29.306	491	61.33	158
24.7	13.278	404	33.30	160	29.797	488	59.75	103
34.7	13.682		31.70		30.285		58.72	
Mean Place	8.543		77.90		25.184		102.49	
Sec δ, Tan δ	1.275		+0.790		1.708		+1.384	
$D_\psi a$, $D_\omega a$	+0.06		+0.05		+0.06		+0.09	
$D_\psi \delta$, $D_\omega \delta$	−0.4		+0.1		−0.4		0.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	π Virginis. Mag. 4.6				ο Virginis. Mag. 4.2				δ Centauri. Mag. 2.9				ε Corvi. Mag. 3.2			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	11 56		+ 7 4		12 0		+ 9 11		12 3		−50 15		12 5		−22 9	
	s		″		s		″		s		″		s		″	
Jan. 0.7	35.205		48.69		56.939		48.01		60.583		7.89		48.996		8.68	
10.7	35.536	331	46.67	202	57.272	333	46.02	199	61.034	451	10.20	231	49.344	348	11.04	236
20.7	35.847	311	44.85	182	57.586	314	44.27	175	61.454	420	12.88	268	49.672	328	13.51	247
30.6	36.130	283	43.29	156	57.872	286	42.77	150	61.833	379	15.86	298	49.968	296	16.02	251
Feb. 9.6	36.376	246	42.02	127	58.122	250	41.59	118	62.162	329	19.04	318	50.228	260	18.50	248
19.6	36.581	205	41.04	98	58.331	209	40.72	87	62.435	273	22.33	329	50.447	219	20.88	238
29.6	36.744	163	40.38	66	58.498	167	40.18	54	62.651	216	25.67	334	50.622	175	23.12	224
Mar. 10.5	36.863	119	40.01	37	58.621	123	39.95	23	62.809	158	28.98	331	50.754	132	25.17	205
20.5	36.940	77	39.92	9	58.703	82	39.98	3	62.910	101	32.18	320	50.845	91	27.03	186
30.5	36.980	40	40.06	14	58.746	43	40.26	28	62.958	48	35.20	302	50.896	51	28.64	161
Apr. 9.5	36.986	6	40.40	34	58.755	9	40.73	47	62.957	1	38.02	282	50.913	17	30.02	138
19.4	36.963	23	40.89	49	58.734	21	41.34	61	62.912	45	40.56	254	50.900	13	31.15	113
29.4	36.917	46	41.49	60	58.690	44	42.06	72	62.829	83	42.79	223	50.862	38	32.03	88
May 9.4	36.851	66	42.16	67	58.626	64	42.82	76	62.712	117	44.68	189	50.804	58	32.66	63
19.3	36.773	78	42.88	72	58.548	78	43.61	79	62.568	144	46.19	151	50.727	77	33.05	39
29.3	36.685	88	43.58	70	58.460	88	44.38	77	62.399	169	47.29	110	50.638	89	33.19	14
June 8.3	36.590	95	44.27	69	58.366	94	45.12	74	62.213	186	47.98	69	50.538	100	33.11	8
18.3	36.493	97	44.92	65	58.267	99	45.78	66	62.014	199	48.22	24	50.433	105	32.78	33
28.2	36.396	97	45.50	58	58.169	98	46.36	58	61.808	206	48.05	17	50.323	110	32.25	53
July 8.2	36.303	93	46.01	51	58.073	96	46.84	48	61.600	208	47.44	61	50.213	110	31.51	74
18.2	36.216	87	46.41	40	57.982	91	47.20	36	61.398	202	46.43	101	50.107	106	30.61	90
28.2	36.137	79	46.69	28	57.901	81	47.42	22	61.209	189	45.05	138	50.009	98	29.56	105
Aug. 7.1	36.072	65	46.85	16	57.832	69	47.49	7	61.041	168	43.33	172	49.922	87	28.40	116
17.1	36.023	49	46.85	0	57.778	54	47.40	9	60.900	141	41.34	199	49.853	69	27.17	123
27.1	35.995	28	46.68	17	57.745	33	47.13	27	60.796	104	39.13	221	49.804	49	25.92	125
Sept. 6.0	35.990	5	46.32	36	57.736	9	46.66	47	60.737	59	36.81	232	49.785	19	24.72	120
16.0	36.016	26	45.76	56	57.757	21	45.96	70	60.730	7	34.45	236	49.798	13	23.60	112
26.0	36.076	60	44.96	80	57.810	53	45.05	91	60.781	51	32.15	230	49.849	51	22.65	95
Oct. 6.0	36.171	95	43.93	103	57.900	90	43.89	116	60.896	115	30.02	213	49.941	92	21.94	71
15.9	36.306	135	42.65	128	58.031	131	42.49	140	61.076	180	28.13	189	50.078	137	21.49	45
25.9	36.481	175	41.13	152	58.204	173	40.86	163	61.322	246	26.61	152	50.262	184	21.38	11
Nov. 4.9	36.698	217	39.38	175	58.417	213	39.02	184	61.629	307	25.50	111	50.491	229	21.63	25
14.9	36.953	255	37.44	194	58.669	252	37.00	202	61.992	363	24.90	60	50.761	270	22.28	65
24.8	37.241	288	35.34	210	58.954	285	34.84	216	62.402	410	24.81	9	51.066	305	23.31	103
Dec. 4.8	37.556	315	33.15	219	59.268	314	32.60	224	62.846	444	25.30	49	51.399	333	24.69	138
14.8	37.888	332	30.92	223	59.598	330	30.34	226	63.311	465	26.32	102	51.751	352	26.43	174
24.7	38.227	339	28.72	220	59.938	340	28.14	220	63.782	471	27.88	156	52.109	358	28.46	203
31.7	38.563	336	26.63	209	60.275	337	26.07	207	64.244	462	29.91	203	52.464	355	30.69	223
Mean Place	34.106		57.80		55.851		57.96		59.891		17.12		48.125		9.56	
Sec δ, Tan δ	1.008		+0.124		1.013		+0.162		1.564		−1.203		1.080		−0.407	
$D_\psi \alpha$, $D_\omega \alpha$	+0.06		+0.01		+0.06		+0.01		+0.06		−0.08		+0.06		−0.03	
$D_\psi \delta$, $D_\omega \delta$	−0.4		0.0		−0.4		0.0		−0.4		0.0		−0.4		0.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	4 H. Draconis. Mag. 5.1				δ Crucis. Mag. 3.1				δ Ursæ Majoris. Mag. 3.4				γ C Mag	
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.	
	h m 12 8		° ′ +78 4		h m 12 10		° ′ −58 16		h m 12 11		° ′ +57 29		h m 12 11	
	s		″		s		″		s		″		s	
Jan. 0.7	20.05		33.05		41.439		44.31		18.259		34.04		29.889	
		117		25		529		215		520		85		343
10.7	21.22		32.80	—	41.968		46.46		18.779		33.19		30.232	
		111		41		493		258		497		26		324
20.7	22.33		33.21		42.461		49.04		19.276		32.93	—	30.556	
		103		103		448		294		459		34		294
30.6	23.36		34.24		42.909		51.98		19.735		33.27		30.850	
		91		161		391		321		407		91		260
Feb. 9.6	24.27		35.85		43.300		55.19		20.142		34.18		31.110	
		76		212		326		340		342		144		220
19.6	25.03		37.97		43.626		58.59		20.484		35.62		31.330	
		56		254		259		350		269		189		178
29.6	25.59		40.51		43.885		62.09		20.753		37.51		31.508	
		38		282		191		352		190		224		136
Mar. 10.5	25.97		43.33		44.076		65.61		20.943		39.75		31.644	
		17		302		125		346		114		248		96
20.5	26.14	—	46.35		44.201		69.07		21.057		42.23		31.740	
		2		305		60		333		35		263		58
30.5	26.12		49.40		44.261		72.40		21.092	—	44.86		31.798	
		22		299		0		315		35		266		23
Apr. 9.5	25.90		52.39		44.261		75.55		21.057		47.52		31.821	—
		40		280		54		289		98		256		5
19.4	25.50		55.19		44.207		78.44		20.959		50.08		31.816	
		54		250		104		259		154		239		32
29.4	24.96		57.69		44.103		81.03		20.805		52.47		31.784	
		68		212		147		224		200		212		51
May 9.4	24.28		59.81		43.956		83.27		20.605		54.59		31.733	
		80		168		183		186		234		179		69
19.3	23.48		61.49		43.773		85.13		20.371		56.38		31.664	
		85		118		217		143		261		139		82
29.3	22.63		62.67		43.556		86.56		20.110		57.77		31.582	
		91		64		242		98		276		96		92
June 8.3	21.72		63.31		43.314		87.54		19.834		58.73		31.490	
		93		9		261		52		284		51		98
18.3	20.79		63.40	—	43.053		88.06		19.550		59.24		31.392	
		92		47		272		4		283		2		103
28.2	19.87		62.93		42.781		88.10	—	19.267		59.26	—	31.289	
		89		101		274		42		275		46		103
July 8.2	18.98		61.92		42.507		87.68		18.992		58.80		31.186	
		84		153		270		89		259		93		101
18.2	18.14		60.39		42.237		86.79		18.733		57.87		31.085	
		75		201		256		133		238		137		95
28.2	17.39		58.38		41.981		85.46		18.495		56.50		30.990	
		68		245		232		171		210		180		85
Aug. 7.1	16.71		55.93		41.749		83.75		18.285		54.70		30.905	
		58		284		197		205		174		220		67
17.1	16.13		53.09		41.552		81.70		18.111		52.50		30.838	
		46		318		151		231		135		254		48
27.1	15.67		49.91		41.401		79.39		17.976		49.96		30.790	
		31		345		97		249		88		284		22
Sept. 6.0	15.36		46.46		41.304		76.90		17.888		47.12		30.768	—
		19		366		34		260		37		311		9
16.0	15.17		42.80		41.270	—	74.30		17.851	—	44.01		30.777	
		4		379		39		256		21		330		43
26.0	15.13	—	39.01		41.309		71.74		17.872		40.71		30.820	
		13		385		116		246		82		345		86
Oct. 6.0	15.26		35.16		41.425		69.28		17.954		37.26		30.906	
		29		383		196		223		150		353		128
15.9	15.55		31.33		41.621		67.05		18.104		33.73		31.034	
		44		372		275		191		215		351		173
25.9	15.99		27.61		41.896		65.14		18.319		30.22		31.207	
		61		352		349		149		284		344		218
Nov. 4.9	16.60		24.09		42.245		63.65		18.603		26.78		31.425	
		75		325		418		100		347		328		258
14.9	17.35		20.84		42.663		62.65		18.950		23.50		31.683	
		90		286		474		45		405		301		295
24.8	18.25		17.98		43.137		62.20	—	19.355		20.49		31.978	
		100		241		516		13		456		268		321
Dec. 4.8	19.25		15.57		43.653		62.33		19.811		17.81		32.299	
		110		186		542		72		493		225		341
14.8	20.35		13.71		44.195		63.05		20.304		15.56		32.640	
		115		128		551		129		514		176		350
24.7	21.50		12.43		44.746		64.34		20.818		13.80		32.990	
		117		64		541		182		521		121		348
34 7	22.67		11.79		45.287		66.16		21.339		12.59		33.338	
Mean Place	16.804		58.72		40.888		55.26		16.633		57.52		29.023	
Sec δ, Tan δ	4.841		+4.736		1.902		−1.618		1.861		+1.570		1.046	
$D_\psi \alpha, D_\omega \alpha$	+0.06		+0.32		+0.06		−0.11		+0.06		+0.10		+0.06	
$D_\psi \delta, D_\omega \delta$	−0.4		0.0		−0.4		0.0		−0.4		0.0		−0.4	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	2 Canum Venat. Mag. 5.8				β Chamæleontis. Mag. 4.4				η Virginis. Mag. 4.0				α^1 Crucis. Mag. 1.6			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 12 11		° ′ +41 6		h m 12 13		° ′ −78 50		h m 12 15		° ′ − 0 12		h m 12 21		° ′ −62 37	
	s		″		s		″		s		″		s		″	
Jan. 0.7	56.644	403	79.34	131	23.17	125	30.91	175	37.439	334	7.29	214	55.25	60	49.80	194
10.7	57.047	385	78.03	80	24.42	116	32.66	229	37.773	317	9.43	204	55.85	56	51.74	242
20.7	57.432	355	77.23	28	25.58	105	34.95	277	38.090	290	11.47	185	56.41	51	54.16	281
30.7	57.787	315	76.95	24	26.63	91	37.72	317	38.380	257	13.32	162	56.92	45	56.97	314
Feb. 9.6	58.102	266	77.19	72	27.54	75	40.89	349	38.637	219	14.94	136	57.37	39	60.11	336
19.6	58.368	212	77.91	116	28.29	60	44.38	369	38.856	179	16.30	108	57.76	31	63.47	352
29.6	58.580	157	79.07	153	28.89	42	48.07	383	39.035	138	17.38	80	58.07	24	66.99	357
Mar. 10.5	58.737	100	80.60	180	29.31	24	51.90	388	39.173	97	18.18	55	58.31	16	70.56	357
20.5	58.837	47	82.40	199	29.55	7	55.78	383	39.270	59	18.73	28	58.47	8	74.13	346
30.5	58.884	2	84.39	209	29.62	9	59.61	372	39.329	26	19.01	7	58.55	2	77.59	331
Apr. 9.5	58.882	45	86.48	210	29.53	24	63.33	351	39.355	2	19.08	10	58.57	5	80.90	309
19.4	58.837	83	88.58	202	29.29	39	66.84	326	39.353	28	18.98	27	58.52	10	83.99	281
29.4	58.754	112	90.60	186	28.90	53	70.10	291	39.325	48	18.71	39	58.42	15	86.80	248
May 9.4	58.642	135	92.46	163	28.37	65	73.01	253	39.277	63	18.32	49	58.27	21	89.28	210
19.4	58.507	152	94.09	136	27.72	74	75.54	208	39.214	77	17.83	55	58.06	24	91.38	168
29.3	58.355	163	95.45	103	26.98	82	77.62	159	39.137	85	17.28	59	57.82	28	93.06	122
June 8.3	58.192	169	96.48	67	26.16	89	79.21	107	39.052	92	16.69	62	57.54	30	94.28	75
18.3	58.023	168	97.15	31	25.27	93	80.28	53	38.960	94	16.07	62	57.24	32	95.03	26
28.2	57.855	163	97.46	6	24.34	94	80.81	3	38.866	96	15.45	60	56.92	33	95.29	23
July 8.2	57.692	155	97.40	44	23.40	92	80.78	58	38.770	93	14.85	57	56.59	33	95.06	72
18.2	57.537	143	96.96	83	22.48	87	80.20	112	38.677	87	14.28	52	56.26	32	94.34	118
28.2	57.394	124	96.13	119	21.61	80	79.08	162	38.590	76	13.76	44	55.94	29	93.16	161
Aug. 7.1	57.270	104	94.94	154	20.81	70	77.46	205	38.514	64	13.32	34	55.65	25	91.55	199
17.1	57.166	76	93.40	185	20.11	55	75.41	245	38.450	45	12.98	20	55.40	20	89.56	229
27.1	57.090	45	91.55	215	19.56	39	72.96	272	38.405	21	12.78	5	55.20	14	87.27	252
Sept. 6.1	57.045	8	89.40	242	19.17	22	70.24	293	38.384	6	12.73	14	55.06	7	84.75	266
16.0	57.037	33	86.98	266	18.95	0	67.31	301	38.390	40	12.87	34	54.99	1	82.09	269
26.0	57.070	79	84.32	285	18.95	20	64.30	298	38.430	78	13.21	58	55.00	11	79.40	261
Oct. 6.0	57.149	127	81.47	298	19.15	42	61.32	284	38.508	118	13.79	84	55.11	19	76.79	243
15.9	57.276	178	78.49	308	19.57	61	58.48	256	38.626	160	14.63	112	55.30	28	74.36	214
25.9	57.454	229	75.41	309	20.18	81	55.92	218	38.786	203	15.75	137	55.58	37	72.22	175
Nov. 4.9	57.683	278	72.32	302	20.99	99	53.74	171	38.989	242	17.12	163	55.95	45	70.47	127
14.9	57.961	323	69.30	291	21.98	112	52.03	115	39.231	277	18.75	184	56.40	53	69.20	74
24.8	58.284	359	66.39	269	23.10	122	50.88	55	39.508	308	20.59	201	56.93	57	68.46	16
Dec. 4.8	58.643	385	63.70	240	24.32	128	50.33	10	39.816	327	22.60	215	57.50	60	68.30	45
14.8	59.028	403	61.30	203	25.60	131	50.43	73	40.143	337	24.75	219	58.10	62	68.75	104
24.8	59.431	406	59.27	159	26.91	128	51.16	135	40.480	337	26.94	218	58.72	60	69.79	159
34.7	59.837		57.68		28.19		52.51		40.817		29.12		59.32		71.38	
Mean Place	55.340		99.33		23.374		44.94		36.498		0.28		54.868		61.43	
Sec δ, Tan δ	1.327		+0.873		5.171		−5.073		1.000		−0.003		2.176		−1.933	
$D_\psi \alpha$, $D_\omega \alpha$	+0.06		+0.06		+0.07		−0.34		+0.06		0.00		+0.06		−0.13	
$D_\psi \delta$, $D_\omega \delta$	−0.4		−0.1		−0.4		−0.1		−0.4		−0.1		−0.4		−0.1	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	20 Comæ. Mag. 5.7				δ Corvi. Mag. 3.1				γ Crucis. Mag. 1.6				8 Canum Ve Mag. 4.3		
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		D
	h m 12 25		° ′ +21 21		h m 12 25		° ′ −16 2		h m 12 26		° ′ −56 38		h m 12 29		+
	s		″		s		″		s		″		s		
Jan. 0.7	31.210		25.52		31.758		54.01		30.167		23.73		46.629		28
		350		186		345		225		521		199		406	
10.7	31.560		23.66		32.103		56.26		30.688		25.72		47.035		27
		336		150		329		230		493		242		392	
20.7	31.896		22.16		32.432		58.56		31.181		28.14		47.427		26
		312		111		302		229		452		277		365	
30.7	32.208		21.05		32.734		60.85		31.633		30.91		47.792		25
		279		72		270		222		401		308		330	
Feb. 9.6	32.487		20.33		33.004		63.07		32.034		33.99		48.122		26
		240		30		233		207		344		326		283	
19.6	32.727		20.03		33.237		65.14		32.378		37.25		48.405		26
		197		9		191		191		280		337		230	
29.6	32.924		20.12		33.428		67.05		32.658		40.62		48.635		27
		152		43		150		170		217		342		177	
Mar. 10.6	33.076		20.55		33.578		68.75		32.875		44.04		48.812		29
		108		76		110		149		154		339		121	
20.5	33.184		21.31		33.688		70.24		33.029		47.43		48.933		31
		67		99		72		125		91		326		67	
30.5	33.251		22.30		33.760		71.49		33.120		50.69		49.000		33
		28		119		39		103		34		310		17	
Apr. 9.5	33.279		23.49		33.799		72.52		33.154		53.79		49.017		35
		5		129		8		79		19		289		28	
19.4	33.274		24.78		33.807		73.31		33.135		56.68		48.989		37
		33		135		17		58		67		260		68	
29.4	33.241		26.13		33.790		73.89		33.068		59.28		48.921		39
		57		133		39		38		112		228		99	
May 9.4	33.184		27.46		33.751		74.27		32.956		61.56		48.822		41
		78		126		58		17		150		192		128	
19.4	33.106		28.72		33.693		74.44		32.806		63.48		48.694		43
		91		115		74		1		183		152		147	
29.3	33.015		29.87		33.619		74.43		32.623		65.00		48.547		45
		102		100		85		20		212		109		162	
June 8.3	32.913		30.87		33.534		74.23		32.411		66.09		48.385		46
		108		82		94		35		234		64		171	
18.3	32.805		31.69		33.440		73.88		32.177		66.73		48.214		47
		113		61		100		50		248		19		176	
28.3	32.692		32.30		33.340		73.38		31.929		66.92		48.038		47
		114		39		104		65		257		27		175	
July 8.2	32.578		32.69		33.236		72.73		31.672		66.65		47.863		47
		111		15		103		76		257		73		170	
18.2	32.467		32.84		33.133		71.97		31.415		65.92		47.693		47
		105		8		99		85		248		116		159	
28.2	32.362		32.76		33.034		71.12		31.167		64.76		47.534		46
		95		35		92		92		231		155		145	
Aug. 7.1	32.267		32.41		32.942		70.20		30.936		63.21		47.389		45
		80		60		76		94		201		188		126	
17.1	32.187		31.81		32.866		69.26		30.735		61.33		47.263		44
		61		85		60		93		162		218		102	
27.1	32.126		30.96		32.806		68.33		30.573		59.15		47.161		42
		39		112		34		87		113		236		71	
Sept. 6.1	32.087		29.84		32.772		67.46		30.460		56.79		47.090		40
		8		136		6		75		53		248		37	
16.0	32.079		28.48		32.766		66.71		30.407		54.31		47.053		37
		25		162		31		60		13		251		5	
26.0	32.104		26.86		32.797		66.11		30.420		51.80		47.058		35
		64		184		70		38		85		242		52	
Oct. 6.0	32.168		25.02		32.867		65.73		30.505		49.38		47.110		32
		105		208		114		11		165		221		100	
16.0	32.273		22.94		32.981		65.62		30.670		47.17		47.210		29
		149		225		160		18		242		193		153	
25.9	32.422		20.69		33.141		65.80		30.912		45.24		47.363		26
		194		241		204		50		316		154		205	
Nov. 4.9	32.616		18.28		33.345		66.30		31.228		43.70		47.568		23
		236		252		247		85		386		108		258	
14.9	32.852		15.76		33.592		67.15		31.614		42.62		47.826		20
		277		256		284		118		443		56		305	
24.8	33.129		13.20		33.876		68.33		32.057		42.06		48.131		17
		309		253		315		151		488		1		345	
Dec. 4.8	33.438		10.67		34.191		69.84		32.545		42.07		48.476		14
		333		244		337		178		520		58		376	
14.8	33.771		8.23		34.528		71.62		33.065		42.65		48.852		11
		347		227		347		200		534		113		398	
24.8	34.118		5.96		34.875		73.62		33.599		43.78		49.250		9
		352		201		349		217		529		166		405	
34.7	34.470		3.95		35.224		75.79		34.128		45.44		49.655		7
Mean Place	30.199		40.14		30.964		52.41		29.724		34.07		45.482		49
Sec δ, Tan δ	1.074		+0.391		1.040		−0.288		1.819		−1.519		1.342		+0
Dψ α, Dω α	*+0.06*		+0.03		+0.06		−0.02		+0.07		−0.10		+0.06		+0
Dψ δ, Dω δ	*−0.4*		−0.1		−0.4		−0.1		−0.4		−0.1		−0.4		−0

Washington Mean Time.	*κ* Draconis. Mag. 3.9				*β* Corvi. Mag. 2.8				24 Comæ *seq.* Mag. 5.2				*α* Muscæ. Mag. 2.9			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 12 29		° ′ +70 14		h m 12 29		° ′ −22 55		h m 12 30		° ′ +18 49		h m 12 32		° ′ −68 40	
	s		″		s		″		s		″		s		″	
Jan. 0.7	56.13		38.43		58.990		55.79		55.978		67.45		9.63		9.83	
10.7	56.88	75	37.67	76	59.346	356	58.02	223	56.325	347	65.52	193	10.36	73	11.53	170
20.7	57.62	74	37.57	10 —	59.687	341	60.38	236	56.660	335	63.93	159	11.06	70	13.74	221
30.7	58.31	69	38.12	55	60.001	314	62.80	242	56.970	310	62.70	123	11.70	64	16.40	266
Feb. 9.6	58.94	63	39.27	115	60.282	281	65.21	241	57.249	279	61.86	84	12.28	58	19.43	303
19.6	59.47	53	40.99	172	60.524	242	67.55	234	57.490	241	61.40	46	12.77	49	22.75	332
29.6	59.90	43	43.18	219	60.725	201	69.77	222	57.690	200	61.34	6 —	13.17	40	26.27	352
Mar. 10.6	60.20	30	45.74	256	60.884	159	71.81	204	57.846	156	61.64	30	13.48	31	29.91	364
20.5	60.40	20	48.55	281	61.002	118	73.68	187	57.959	113	62.24	60	13.69	21	33.58	367
30.5	60.47	7 —	51.50	295	61.082	80	75.33	165	58.032	73	63.10	86	13.82	13	37.20	362
Apr. 9.5	60.42	5	54.48	298	61.128	46	76.76	143	58.067	35	64.15	105	13.86	4 —	40.70	350
19.4	60.26	16	57.35	287	61.141	13 —	77.95	119	58.069	2 —	65.34	119	13.82	4	44.02	332
29.4	59.99	27	60.01	266	61.126	15	78.91	96	58.043	26	66.59	125	13.70	12	47.08	306
May 9.4	59.65	34	62.37	236	61.088	38	79.63	72	57.993	50	67.85	126	13.50	20	49.83	275
19.4	59.25	40	64.35	198	61.031	57	80.12	49	57.923	70	69.06	121	13.24	26	52.21	238
29.3	58.78	47	65.89	154	60.955	76	80.37	25	57.839	84	70.18	112	12.93	31	54.18	197
June 8.3	58.28	50	66.94	105	60.867	88	80.40	3 —	57.743	96	71.17	99	12.57	36	55.70	152
18.3	57.76	52	67.47	53 —	60.767	100	80.19	21	57.638	105	72.01	84	12.17	40	56.73	103
28.3	57.23	53	67.46	1	60.660	107	79.79	40	57.529	109	72.66	65	11.74	43	57.25	52 —
July 8.2	56.71	52	66.93	53	60.548	112	79.18	61	57.418	111	73.11	45	11.30	44	57.24	1
18.2	56.21	50	65.88	105	60.435	113	78.38	80	57.309	109	73.34	23	10.86	44	56.73	51
28.2	55.74	47	64.33	155	60.326	109	77.44	94	57.205	104	73.36	2 —	10.42	44	55.71	102
Aug. 7.1	55.31	43	62.31	202	60.225	101	76.37	107	57.108	97	73.12	24	10.02	40	54.22	149
17.1	54.94	37	59.87	244	60.137	88	75.20	117	57.026	82	72.66	46	9.67	35	52.33	189
27.1	54.63	31	57.05	282	60.069	68	74.00	120	56.962	64	71.94	72	9.37	30	50.06	227
Sept. 6.1	54.39	24	53.90	315	60.025	44	72.83	117	56.921	41	70.98	96	9.16	21	47.50	256
16.0	54.24	15	50.48	342	60.014	11 —	71.71	112	56.908	13 —	69.77	121	9.03	13	44.77	273
26.0	54.17	7 —	46.88	360	60.040	26	70.72	99	56.929	21	68.31	146	9.00	3 —	41.95	282
Oct. 6.0	54.20	3	43.13	375	60.108	68	69.93	79	56.986	57	66.60	171	9.09	9	39.15	280
16.0	54.33	13	39.33	380	60.222	114	69.39	54	57.085	99	64.67	193	9.30	21	36.50	265
25.9	54.57	24	35.55	378	60.383	161	69.16	23 —	57.228	143	62.53	214	9.62	32	34.09	241
Nov. 4.9	54.91	34	31.89	366	60.592	209	69.28	12	57.415	187	60.23	230	10.05	43	32.04	205
14.9	55.34	43	28.45	344	60.845	253	69.75	47	57.646	231	57.81	242	10.58	53	30.45	159
24.8	55.88	54	25.30	315	61.138	293	70.60	85	57.916	270	55.31	250	11.19	61	29.38	107
Dec. 4.8	56.49	61	22.54	276	61.462	324	71.83	123	58.220	304	52.81	250	11.88	69	28.90	48 —
14.8	57.18	69	20.25	229	61.810	348	73.40	157	58.547	327	50.38	243	12.62	74	29.02	12
24.8	57.90	72	18.51	174	62.170	360	75.26	186	58.890	343	48.09	229	13.37	75	29.75	73
34.7	58.67	77	17.38	113	62.530	360	77.36	210	59.238	348	46.03	206	14.11	74	31.07	132
Mean Place	54.348		64.12		58.260		56.47		55.021		81.36		9.530		22.30	
Sec δ, Tan δ	2.958		+2.785		1.086		−0.423		1.057		+0.341		2.750		−2.561	
$D_\psi \alpha$, $D_\omega \alpha$	+0.05		+0.18		+0.06		−0.03		+0.06		+0.02		+0.07		−0.17	
$D_\psi \delta$, $D_\omega \delta$	−0.4		−0.1		−0.4		−0.1		−0.4		−0.1		−0.4		−0.1	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	*χ* **Virginis.** Mag. 4.8 Right Ascension.		Declination.		*γ* **Centauri.** Mag. 2.4 Right Ascension.		Declination.		*γ* **Virginis** (*mean*). Mag. 2.9 Right Ascension.		Declination.		*ρ* **Virginis.** Mag. 5.0 Right Ascension.		Declin
	h m 12 34		° ′ − 7 32		h m 12 36		° ′ −48 29		h m 12 37		° ′ − 0 59		h m 12 37		° +10
	s		″		s		″		s		″		s		″
Jan. 0.7	55.329		5.27		53.135		47.04		25.056		27.01		38.877		42.47
10.7	55.668	339	7.45	218	53.591	456	49.02	198	25.392	336	29.16	215	39.217	340	40.43
20.7	55.993	325	9.60	215	54.025	434	51.37	235	25.716	324	31.20	204	39.545	328	38.61
30.7	56.295	302	11.66	206	54.427	402	54.03	266	26.016	300	33.07	187	39.850	305	37.08
Feb. 9.6	56.566	271	13.56	190	54.788	361	56.92	289	26.287	271	34.72	165	40.127	277	35.88
19.6	56.802	236	15.25	169	55.100	312	59.96	304	26.523	236	36.13	141	40.367	240	35.02
29.6	56.998	196	16.72	147	55.360	260	63.08	312	26.720	197	37.25	112	40.567	200	34.49
Mar. 10.6	57.156	158	17.94	122	55.567	207	66.20	312	26.877	157	38.11	86	40.727	160	34.31
20.5	57.274	118	18.91	97	55.721	154	69.25	305	26.996	119	38.69	58	40.846	119	34.44
30.5	57.355	81	19.64	73	55.824	103	72.19	294	27.077	81	39.01	32	40.927	81	34.81
Apr. 9.5	57.404	49	20.15	51	55.879	55	74.96	277	27.126	49	39.11	10	40.973	46	35.40
19.4	57.422	18	20.43	28	55.889	10	77.49	253	27.143	17	39.02	9	40.986	13	36.17
29.4	57.413	9	20.54	11	55.859	30	79.78	229	27.135	8	38.76	26	40.973	13	37.04
May 9.4	57.381	32	20.49	5	55.793	66	81.76	198	27.103	32	38.38	38	40.937	36	37.97
19.4	57.332	49	20.28	21	55.695	98	83.40	164	27.053	50	37.90	48	40.881	56	38.92
29.3	57.266	66	19.97	31	55.567	128	84.69	129	26.987	66	37.34	56	40.809	72	39.85
June 8.3	57.189	77	19.55	42	55.417	150	85.61	92	26.909	78	36.74	60	40.725	84	40.72
18.3	57.102	87	19.04	51	55.245	172	86.12	51	26.822	87	36.12	62	40.632	93	41.51
28.3	57.008	94	18.47	57	55.060	185	86.22	10	26.729	93	35.50	62	40.534	98	42.19
July 8.2	56.910	98	17.84	63	54.866	194	85.91	31	26.631	98	34.88	62	40.432	102	42.74
18.2	56.811	99	17.19	65	54.668	198	85.21	70	26.532	99	34.30	58	40.329	103	43.15
28.2	56.715	96	16.52	67	54.475	193	84.14	107	26.435	97	33.77	53	40.229	100	43.40
Aug. 7.1	56.626	89	15.85	67	54.293	182	82.72	142	26.345	90	33.31	46	40.138	91	43.48
17.1	56.549	77	15.25	60	54.131	162	81.01	171	26.266	79	32.95	36	40.057	81	43.37
27.1	56.487	62	14.71	54	53.999	132	79.06	195	26.203	63	32.71	24	39.993	64	43.06
Sept. 6.1	56.447	40	14.27	44	53.903	96	76.94	212	26.161	42	32.62	9	39.949	44	42.54
16.0	56.435	12	14.00	27	53.856	47	74.73	221	26.147	14	32.70	8	39.933	16	41.78
26.0	56.457	22	13.90	10	53.862	6	72.53	220	26.164	17	32.99	29	39.950	17	40.80
Oct. 6.0	56.516	59	14.03	13	53.928	66	70.44	209	26.219	55	33.51	52	40.002	52	39.57
16.0	56.617	101	14.40	37	54.058	130	68.52	192	26.315	96	34.29	78	40.094	92	38.10
25.9	56.761	144	15.06	66	54.256	198	66.90	162	26.453	138	35.32	103	40.231	137	36.39
Nov. 4.9	56.951	190	16.00	94	54.517	261	65.65	125	26.636	183	36.62	130	40.412	181	34.48
14.9	57.182	231	17.24	124	54.838	321	64.83	82	26.861	225	38.18	156	40.635	223	32.37
24.8	57.452	270	18.75	151	55.211	373	64.49	34	27.125	264	39.95	177	40.897	262	30.13
Dec. 4.8	57.754	302	20.50	175	55.627	416	64.67	18	27.420	295	41.91	196	41.193	296	27.82
14.8	58.078	324	22.45	195	56.072	445	65.38	71	27.738	318	44.01	210	41.512	319	25.49
24.8	58.416	338	24.54	209	56.533	461	66.59	121	28.071	333	46.17	216	41.847	335	23.21
34.7	58.757	341	26.70	216	56.994	461	68.28	169	28.408	337	48.34	217	42.187	340	21.07
Mean Place	54.542		0.49		52.657		55.28		24.250		19.84		38.011		53.77
Sec δ, Tan δ	1.009		−0.132		1.509		−1.131		1.000		−0.017		1.018		+0.18
$D_\psi\, a$, $D_\omega\, a$	+0.06		−0.01		+0.07		−0.07		+0.06		0.00		+0.06		+0.01
$D_\psi\, \delta$, $D_\omega\, \delta$	−0.4		−0.2		−0.4		−0.2		−0.4		−0.2		−0.4		−0.2

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	76 Ursæ Majoris. Mag. 5.9				β Crucis. Mag. 1.5				31 Comæ. Mag. 5.1				η Centauri. Mag. 4.3			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	12 37		+63 9		12 42		−59 13		12 47		+27 59		12 48		−39 43	
	s		″		s		″		s		″		s		″	
Jan. 0.8	55.40		61.65		48.424		36.84		37.372		34.03		47.242		14.54	
		59		103		562		172		365		186		412		196
10.7	55.99		60.62		48.986		38.56		37.737		32.17		47.654		16.50	
		59		40		537		220		352		146		396		227
20.7	56.58		60.22		49.523		40.76		38.089		30.71		48.050		18.77	
		54		23		499		259		332		102		371		251
30.7	57.12		60.45		50.022		43.35		38.421		29.69		48.421		21.28	
		50		85		449		291		303		55		335		267
Feb. 9.6	57.62		61.30		50.471		46.26		38.724		29.14		48.756		23.95	
		42		142		391		316		267		9		294		276
19.6	58.04		62.72		50.862		49.42		38.991		29.05		49.050		26.71	
		36		190		327		332		224		36		249		278
29.6	58.40		64.62		51.189		52.74		39.215		29.41		49.299		29.49	
		26		232		232		339		179		75		204		275
Mar. 10.6	58.66		66.94		51.451		56.13		39.394		30.16		49.503		32.24	
		18		262		196		340		134		110		157		266
20.5	58.84		69.56		51.647		59.53		39.528		31.26		49.660		34.90	
		8		280		129		333		90		136		113		251
30.5	58.92		72.36		51.776		62.86		39.618		32.62		49.773		37.41	
		0		286		69		320		49		156		71		234
Apr. 9.5	58.92		75.22		51.845		66.06		39.667		34.18		49.844		39.75	
		9		281		9		301		11		169		34		212
19.5	58.83		78.03		51.854		69.07		39.678		35.87		49.878		41.87	
		16		265		45		276		22		171		1		189
29.4	58.67		80.68		51.809		71.83		39.656		37.58		49.877		43.76	
		21		241		96		246		49		169		33		160
May 9.4	58.46		83.09		51.713		74.29		39.607		39.27		49.844		45.36	
		27		207		140		212		74		158		62		133
19.4	58.19		85.16		51.573		76.41		39.533		40.85		49.782		46.69	
		31		167		181		174		93		143		86		101
29.3	57.88		86.83		51.392		78.15		39.440		42.28		49.696		47.70	
		34		122		217		132		107		123		109		68
June 8.3	57.54		88.05		51.175		79.47		39.333		43.51		49.587		48.38	
		36		74		245		87		120		100		126		35
18.3	57.18		88.79		50.930		80.34		39.213		44.51		49.461		48.73	
		37		25		268		41		127		72		141		2
28.3	56.81		89.04		50.662		80.75		39.086		45.23		49.320		48.75	
		36		28		281		6		131		45		152		33
July 8.2	56.45		88.76		50.381		80.69		38.955		45.68		49.168		48.42	
		36		77		286		52		131		14		156		66
18.2	56.09		87.99		50.095		80.17		38.824		45.82		49.012		47.76	
		34		126		282		98		128		17		157		96
28.2	55.75		86.73		49.813		79.19		38.696		45.65		48.855		46.80	
		31		173		265		139		119		46		149		124
Aug. 7.2	55.44		85.00		49.548		77.80		38.577		45.19		48.706		45.56	
		27		215		240		177		107		79		136		147
17.1	55.17		82.85		49.308		76.03		38.470		44.40		48.570		44.09	
		23		255		201		210		90		109		113		167
27.1	54.94		80.30		49.107		73.93		38.380		43.31		48.457		42.42	
		18		290		151		233		66		138		83		179
Sept. 6.1	54.76		77.40		48.956		71.60		38.314		41.93		48.374		40.63	
		12		318		89		250		38		167		47		184
16.0	54.64		74.22		48.867		69.10		38.276		40.26		48.327		38.79	
		5		341		19		256		5		193		0		181
26.0	54.59		70.81		48.848		66.54		38.271		38.33		48.327		36.98	
		2		360		60		252		35		220		50		169
Oct. 6.0	54.61		67.21		48.908		64.02		38.306		36.13		48.377		35.29	
		9		370		144		238		78		240		105		151
16.0	54.70		63.51		49.052		61.64		38.384		33.73		48.482		33.78	
		18		370		228		211		125		259		163		123
25.9	54.88		59.81		49.280		59.53		38.509		31.14		48.645		32.55	
		26		365		310		177		174		272		221		89
Nov. 4.9	55.14		56.16		49.590		57.76		38.683		28.42		48.866		31.66	
		33		349		388		134		221		280		275		49
14.9	55.47		52.67		49.978		56.42		38.904		25.62		49.141		31.17	
		43		325		453		83		264		281		325		5
24.9	55.90		49.42		50.431		55.59		39.168		22.81		49.466		31.12	
		48		290		507		30		301		274		364		41
Dec. 4.8	56.38		46.52		50.938		55.29		39.469		20.07		49.830		31.53	
		53		248		545		29		331		259		304		88
14.8	56.91		44.04		51.483		55.58		39.800		17.48		50.224		32.41	
		57		197		565		85		352		238		410		132
24.8	57.48		42.07		52.048		56.43		40.152		15.10		50.634		33.73	
		58		139		568		139		360		206		414		172
34.7	58.06		40.68		52.616		57.82		40.512		13.04		51.048		35.45	
Mean Place	54.021		86.67		48.163		47.41		36.483		51.16		46.748		20.14	
Sec δ, Tan δ	2.215		+1.977		1.955		−1.679		1.133		+0.532		1.300		−0.831	
$D_\phi \alpha$, $D_\omega \alpha$	+0.05		+0.13		+0.07		−0.11		+0.06		+0.03		+0.07		−0.05	
$D_\phi \delta$, $D_\omega \delta$	−0.4		−0.2		−0.4		−0.2		−0.4		−0.2		−0.4		−0.2	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	**ε Ursæ Majoris.** (*Alioth.*) Mag. 1.7				**δ Virginis.** Mag. 3.7				**α Can. Ven.** *seq.* Mag. 2.9				**δ Muscæ.** Mag. 3.6			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	12 50		+56 24		12 51		+ 3 50		12 52		+38 45		12 56		−71 5	
	s		″		s		″		s		″		s		″	
Jan. 0.8	21.363	506	31.90	134	23.035	337	64.24	212	6.960	393	58.22	172	27.86	83	33.45	126
10.7	21.869	496	30.56	74	23.372	328	62.12	197	7.353	386	56.50	122	28.69	81	34.71	184
20.7	22.365	473	29.82	12	23.700	307	60.15	174	7.739	364	55.28	70	29.50	76	36.55	232
30.7	22.838	433	29.70	50	24.007	280	58.41	149	8.103	334	54.58	16	30.26	69	38.87	275
Feb. 9.6	23.271	379	30.20	106	24.287	246	56.92	118	8.437	294	54.42	36	30.95	61	41.62	309
19.6	23.650	317	31.26	159	24.533	210	55.74	89	8.731	247	54.78	85	31.56	52	44.71	333
29.6	23.967	248	32.85	203	24.743	170	54.86	57	8.978	198	55.63	128	32.08	41	48.04	352
Mar. 10.6	24.215	175	34.88	235	24.913	131	54.28	28	9.176	146	56.91	164	32.49	33	51.56	361
20.5	24.390	101	37.23	260	25.044	95	54.00	3	9.322	95	58.55	190	32.82	22	55.17	362
30.5	24.491	33	39.83	272	25.139	60	53.97	21	9.417	48	60.45	208	33.04	12	58.79	355
Apr. 9.5	24.524	33	42.55	272	25.199	29	54.18	39	9.465	4	62.53	216	33.16	3	62.34	343
19.5	24.491	93	45.27	262	25.228	3	54.57	54	9.469	36	64.69	216	33.19	7	65.77	323
29.4	24.398	144	47.89	243	25.231	22	55.11	64	9.433	69	66.85	205	33.12	15	69.00	295
May 9.4	24.254	186	50.32	215	25.209	42	55.75	72	9.364	96	68.90	190	32.97	23	71.95	263
19.4	24.068	223	52.47	181	25.167	59	56.47	75	9.268	122	70.80	166	32.74	31	74.58	226
29.3	23.845	249	54.28	142	25.108	74	57.22	74	9.146	138	72.46	140	32.43	37	76.84	182
June 8.3	23.596	267	55.70	97	25.034	84	57.96	72	9.008	153	73.86	106	32.06	42	78.66	136
18.3	23.329	277	56.67	50	24.950	94	58.68	68	8.855	161	74.92	71	31.64	47	80.02	87
28.3	23.052	282	57.17	2	24.856	99	59.36	61	8.694	167	75.63	34	31.17	50	80.89	34
July 8.2	22.770	278	57.19	45	24.757	103	59.97	54	8.527	165	75.97	3	30.67	51	81.23	18
18.2	22.492	267	56.74	93	24.654	102	60.51	44	8.362	161	75.94	43	30.16	51	81.05	68
28.2	22.225	249	55.81	140	24.552	98	60.95	32	8.201	152	75.51	80	29.65	48	80.37	120
Aug. 7.2	21.976	224	54.41	182	24.454	88	61.27	17	8.049	138	74.71	118	29.17	44	79.17	166
17.1	21.752	194	52.59	222	24.366	74	61.44	3	7.911	117	73.53	153	28.73	38	77.51	206
27.1	21.558	153	50.37	259	24.292	54	61.47	16	7.794	91	72.00	186	28.35	31	75.45	240
Sept. 6.1	21.405	108	47.78	290	24.238	28	61.31	35	7.703	59	70.14	218	28.04	21	73.05	266
16.0	21.297	55	44.88	317	24.210	3	60.96	56	7.644	22	67.96	246	27.83	10	70.39	280
26.0	21.242	5	41.71	338	24.213	38	60.40	81	7.622	22	65.50	270	27.73	3	67.59	286
Oct. 6.0	21.247	68	38.33	354	24.251	80	59.59	106	7.644	70	62.80	290	27.76	15	64.73	278
16.0	21.315	138	34.79	360	24.331	124	58.53	129	7.714	121	59.90	306	27.91	28	61.95	260
25.9	21.453	207	31.19	360	24.455	168	57.24	155	7.835	174	56.84	313	28.19	42	59.35	231
Nov. 4.9	21.660	276	27.59	349	24.623	213	55.69	177	8.009	227	53.71	315	28.61	55	57.04	191
14.9	21.936	340	24.10	332	24.836	252	53.92	196	8.236	275	50.56	308	29.16	64	55.13	142
24.9	22.276	398	20.78	303	25.088	285	51.96	212	8.511	318	47.48	294	29.80	73	53.71	88
Dec. 4.8	22.674	446	17.75	267	25.373	313	49.84	219	8.829	353	44.54	289	30.53	79	52.83	29
14.8	23.120	479	15.08	221	25.686	329	47.65	222	9.182	377	41.85	239	31.32	83	52.54	31
24.8	23.599	499	12.87	169	26.015	336	45.43	217	9.559	389	39.46	198	32.15	84	52.85	92
34.7	24.098		11.18		26.351		43.26		9.948		37.48		32.99		53.77	
Mean Place	20.288		56.04		22.287		73.40		6.046		78.47		28.181		45.69	
Sec δ, Tan δ	1.808		+1.506		1.002		+0.067		1.283		+0.803		3.088		−2.921	
$D_\psi\,\alpha$, $D_\omega\,\alpha$	+0.05		+0.10		+0.06		0.00		+0.06		+0.05		+0.08		−0.19	
$D_\psi\,\delta$, $D_\omega\,\delta$	−0.4		−0.2		−0.4		−0.2		−0.4		−0.2		−0.4		−0.2	

FOR THE UPPER TRANSIT AT WASHINGTON.

shington an Time.	**ε Virginis.** Mag. 3.0				**θ Virginis.** Mag. 4.4				**43 Comæ.** Mag. 4.3				**20 Canum Venat.** Mag. 4.7			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 12 57		° ′ +11 24		h m 13 5		° ′ − 5 5		h m 13 7		° ′ +28 17		h m 13 13		° ′ +41 0	
	s		″		s		″		s		″		s		″	
an. 0.8	60.467	340	25.44	208	36.556	341	33.22	211	58.051	361	55.85	196	47.475	397	31.60	187
10.7	60.807	333	23.36	185	36.897	333	35.33	207	58.412	354	53.89	156	47.872	395	29.73	136
20.7	61.140	313	21.51	155	37.230	314	37.40	195	58.766	340	52.33	111	48.267	381	28.37	81
30.7	61.453	287	19.96	122	37.544	289	39.35	178	59.106	312	51.22	63	48.648	353	27.56	26
eb. 9.7	61.740	254	18.74	87	37.833	258	41.13	155	59.418	280	50.59	15	49.001	317	27.30	29
19.6	61.994	217	17.87	51	38.091	222	42.68	132	59.698	240	50.44	31	49.318	274	27.59	82
29.6	62.211	178	17.36	15	38.313	185	44.00	105	59.938	197	50.75	74	49.592	225	28.41	128
ar. 10.6	62.389	140	17.21	16	38.498	148	45.05	79	60.135	153	51.49	110	49.817	175	29.69	167
20.6	62.529	100	17.37	43	38.646	112	45.84	55	60.288	110	52.59	140	49.992	124	31.36	197
30.5	62.629	65	17.80	67	38.753	78	46.39	32	60.398	69	53.99	163	50.116	75	33.33	220
Apr. 9.5	62.694	32	18.47	84	38.836	48	46.71	12	60.467	31	55.62	177	50.191	27	35.53	230
19.5	62.726	4	19.31	96	38.884	20	46.83	6	60.498	3	57.39	182	50.218	15	37.83	232
29.4	62.730	21	20.27	103	38.904	5	46.77	22	60.495	34	59.21	182	50.203	52	40.15	225
May 9.4	62.709	42	21.30	105	38.899	27	46.55	32	60.461	60	61.03	174	50.151	86	42.40	210
19.4	62.667	61	22.35	102	38.872	45	46.23	42	60.401	82	62.77	158	50.065	114	44.50	188
29.4	62.606	76	23.37	96	38.827	62	45.81	50	60.319	100	64.35	141	49.951	137	46.38	160
June 8.3	62.530	89	24.33	88	38.765	77	45.31	55	60.219	116	65.76	116	49.814	154	47.98	126
18.3	62.441	98	25.21	75	38.688	87	44.76	59	60.103	127	66.92	91	49.660	169	49.24	92
28.3	62.343	104	25.96	62	38.601	97	44.17	60	59.976	134	67.83	60	49.491	178	50.16	53
July 8.3	62.239	108	26.58	47	38.504	103	43.57	61	59.842	138	68.43	30	49.313	182	50.69	11
18.2	62.131	108	27.05	28	38.401	104	42.96	59	59.704	139	68.73	0	49.131	181	50.80	29
28.2	62.023	105	27.33	11	38.297	103	42.37	56	59.565	134	68.73	34	48.950	175	50.51	69
Aug. 7.2	61.918	95	27.44	9	38.194	96	41.81	49	59.431	125	68.39	66	48.775	163	49.82	109
17.1	61.823	82	27.35	30	38.098	84	41.32	41	59.306	110	67.73	97	48.612	147	48.73	148
27.1	61.741	62	27.05	52	38.014	64	40.91	29	59.196	90	66.76	129	48.465	121	47.25	183
Sept. 6.1	61.679	36	26.53	76	37.950	40	40.62	14	59.106	62	65.47	159	48.344	92	45.42	218
16.1	61.643	7	25.77	99	37.910	8	40.48	3	59.044	29	63.88	187	48.252	54	43.24	248
26.0	61.636	30	24.78	125	37.902	28	40.51	25	59.015	9	62.01	215	48.198	9	40.76	275
Oct. 6.0	61.666	72	23.53	149	37.930	69	40.76	49	59.024	53	59.86	237	48.189	38	38.01	298
16.0	61.738	115	22.04	173	37.999	114	41.25	75	59.077	99	57.49	258	48.227	92	35.03	315
25.9	61.853	160	20.31	194	38.113	161	42.00	101	59.176	149	54.91	273	48.319	147	31.88	324
Nov. 4.9	62.013	206	18.37	213	38.274	205	43.01	129	59.325	198	52.18	282	48.466	202	28.64	328
14.9	62.219	246	16.24	226	38.479	247	44.30	154	59.523	244	49.36	285	48.668	256	25.36	322
24.9	62.465	282	13.98	235	38.726	281	45.84	175	59.767	284	46.51	281	48.924	303	22.14	307
Dec. 4.8	62.747	310	11.63	236	39.007	312	47.59	193	60.051	318	43.70	266	49.227	343	19.07	286
14.8	63.057	329	9.27	232	39.319	329	49.52	204	60.369	342	41.04	246	49.570	372	16.21	253
24.8	63.386	338	6.95	217	39.648	338	51.56	212	60.711	356	38.58	215	49.942	391	13.68	214
34.8	63.724		4.78		39.986		53.68		61.067		36.43		50.333		11.54	
ean Place	59.727		37.35		35.932		26.99		57.316		73.34		46.752		52.61	
ec δ, Tan δ	1.020		+0.202		1.004		−0.089		1.136		+0.538		1.325		+0.870	
$\psi\,a$, $D_\omega\,a$	+0.06		+0.01		+0.06		−0.01		+0.06		+0.03		+0.05		+0.06	
$\psi\,\delta$, $D_\omega\,\delta$	−0.4		−0.3		−0.4		−0.3		−0.4		−0.3		−0.4		−0.3	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Hydræ. Mag. 3.3				ι Centauri. Mag. 2.9				ζ¹ Ursæ Majoris. (*Mizar.*) Mag. 2.4				α Virginis. (*Spica.*) Mag. 1.2			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 13 14		° ′ −22 43		h m 13 15		° ′ −36 16		h m 13 20		° ′ +55 21		h m 13 20		° ′ −10 43	
	s		″		s		″		s		″		s		″	
Jan. 0.8	21.564	363	43.44	195	52.470	401	6.37	175	33.494	485	25.39	171	46.446	345	27.86	204
10.7	21.927	355	45.39	211	52.871	393	8.12	204	33.979	488	23.68	112	46.791	339	29.90	206
20.7	22.282	337	47.50	217	53.264	373	10.16	225	34.467	474	22.56	48	47.130	324	31.96	201
30.7	22.619	311	49.67	219	53.637	344	12.41	240	34.941	443	22.08	— 14	47.454	300	33.97	189
Feb. 9.7	22.930	280	51.86	213	53.981	309	14.81	249	35.384	400	22.22	75	47.754	270	35.86	174
19.6	23.210	244	53.99	205	54.290	270	17.30	252	35.784	347	22.97	132	48.024	238	37.60	153
29.6	23.454	206	56.04	192	54.560	229	19.82	248	36.131	284	24.29	181	48.262	201	39.13	132
Mar. 10.6	23.660	167	57.96	175	54.789	187	22.30	240	36.415	219	26.10	221	48.463	165	40.45	109
20.6	23.827	130	59.71	156	54.976	145	24.70	228	36.634	150	28.31	252	48.628	129	41.54	86
30.5	23.957	96	61.27	137	55.121	105	26.98	211	36.784	81	30.83	269	48.757	97	42.40	63
Apr. 9.5	24.053	63	62.64	116	55.226	69	29.09	194	36.865	18	33.52	279	48.854	65	43.03	44
19.5	24.116	32	63.80	96	55.295	33	31.03	172	36.883	— 42	36.31	275	48.919	37	43.47	25
29.4	24.148	6	64.76	75	55.328	2	32.75	150	36.841	98	39.06	262	48.956	10	43.72	8
May 9.4	24.154	— 20	65.51	56	55.330	— 28	34.25	124	36.743	145	41.68	240	48.966	— 14	43.80	— 6
19.4	24.134	41	66.07	36	55.302	54	35.49	99	36.598	185	44.08	210	48.952	33	43.74	19
29.4	24.093	62	66.43	15	55.248	81	36.48	70	36.413	219	46.18	174	48.919	53	43.55	30
June 8.3	24.031	80	66.58	— 4	55.167	101	37.18	42	36.194	245	47.92	133	48.866	70	43.25	39
18.3	23.951	95	66.54	23	55.066	121	37.60	11	35.949	265	49.25	88	48.796	85	42.86	48
28.3	23.856	107	66.31	40	54.945	135	37.71	— 18	35.684	275	50.13	42	48.711	96	42.38	54
July 8.3	23.749	117	65.91	58	54.810	146	37.53	46	35.409	281	50.55	— 9	48.615	105	41.84	60
18.2	23.632	120	65.33	74	54.664	151	37.07	75	35.128	280	50.46	56	48.510	110	41.24	63
28.2	23.512	119	64.59	86	54.513	150	36.32	100	34.848	270	49.90	103	48.400	111	40.61	65
Aug. 7.2	23.393	113	63.73	97	54.363	142	35.32	124	34.578	253	48.87	149	48.289	105	39.96	64
17.1	23.280	101	62.76	103	54.221	126	34.08	140	34.325	229	47.38	193	48.184	96	39.32	61
27.1	23.179	80	61.73	105	54.095	103	32.68	154	34.096	196	45.45	231	48.088	77	38.71	53
Sept. 6.1	23.099	54	60.68	102	53.992	70	31.14	160	33.900	157	43.14	269	48.011	54	38.18	44
16.1	23.045	18	59.66	94	53.922	30	29.54	160	33.743	106	40.45	300	47.957	22	37.74	27
26.0	23.027	— 21	58.72	79	53.892	— 17	27.94	152	33.637	51	37.45	326	47.935	— 14	37.47	11
Oct. 6.0	23.048	67	57.93	60	53.909	70	26.42	137	33.586	11	34.19	347	47.949	56	37.36	— 13
16.0	23.115	116	57.33	34	53.979	125	25.05	113	33.597	— 77	30.72	359	48.005	102	37.49	37
26.0	23.231	167	56.99	5	54.104	183	23.92	83	33.674	149	27.13	364	48.107	150	37.86	65
Nov. 4.9	23.398	216	56.94	— 28	54.287	240	23.09	49	33.823	219	23.49	362	48.257	196	38.51	93
14.9	23.614	261	57.22	62	54.527	290	22.60	8	34.042	288	19.87	347	48.453	240	39.44	121
24.9	23.875	300	57.84	96	54.817	332	22.52	— 34	34.330	349	16.40	327	48.693	277	40.65	146
Dec. 4.8	24.175	330	58.80	129	55.149	366	22.86	75	34.679	404	13.13	294	48.970	309	42.11	170
14.8	24.505	352	60.09	158	55.515	389	23.61	116	35.083	445	10.19	252	49.279	330	43.81	187
24.8	24.857	361	61.67	180	55.904	401	24.77	153	35.528	473	7.67	204	49.609	341	45.68	198
34.8	25.218		63.47		56.305		26.30		36.001		5.63		49.950		47.66	
Mean Place	21.082		43.15		52.103		10.35		32.827		49.53		45.933		23.35	
Sec δ, Tan δ	1.084		−0.419		1.240		−0.734		1.759		+1.447		1.018		−0.189	
$D_\psi \alpha$, $D_\omega \alpha$	+0.06		−0.03		+0.07		−0.05		+0.05		+0.09		+0.06		−0.01	
$D_\psi \delta$, $D_\omega \delta$	−0.4		−0.3		−0.4		−0.3		−0.4		−0.3		−0.4		−0.3	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	Groombridge 2001. Mag. 6.1				70 Virginis. Mag. 5.2				ζ Virginis. Mag. 3.4				17 H. Canum Venat. Mag. 5.0			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	13 23		+72 48		13 24		+14 13		13 30		− 0 10		13 31		+37 36	
	s		″		s		″		s		″		s		″	
Jan. 0.8	59.92	81	72.21	139	19.872	341	24.36	216	25.181	337	8.63	210	3.453	382	24.81	205
10.8	60.73	84	70.82	75	20.213	338	22.20	191	25.518	334	10.73	200	3.835	383	22.76	157
20.7	61.57	81	70.07	8	20.551	324	20.29	158	25.852	321	12.73	184	4.218	372	21.19	106
30.7	62.38	77	69.99	— 59	20.875	301	18.71	121	26.173	299	14.57	160	4.590	349	20.13	50
Feb. 9.7	63.15	70	70.58	122	21.176	272	17.50	83	26.472	271	16.17	136	4.939	318	19.63	— 5
19.6	63.85	61	71.80	179	21.448	239	16.67	44	26.743	241	17.53	106	5.257	280	19.68	57
29.6	64.46	49	73.59	226	21.687	202	16.23	6	26.984	205	18.59	77	5.537	236	20.25	105
Mar. 10.6	64.95	36	75.85	266	21.889	165	16.17	— 29	27.189	169	19.36	50	5.773	189	21.30	146
20.6	65.31	23	78.51	291	22.054	126	16.46	58	27.358	135	19.86	22	5.962	141	22.76	180
30.5	65.54	10	81.42	307	22.180	91	17.04	85	27.493	101	20.08	— 1	6.103	96	24.56	206
Apr. 9.5	65.64	— 3	84.49	309	22.271	57	17.89	103	27.594	69	20.07	23	6.199	51	26.62	220
19.5	65.61	17	87.58	298	22.328	28	18.92	116	27.663	42	19.84	38	6.250	11	28.82	227
29.5	65.44	27	90.56	280	22.356	— 1	20.08	123	27.705	15	19.46	52	6.261	— 27	31.09	223
May 9.4	65.17	37	93.36	250	22.355	25	21.31	125	27.720	— 8	18.94	61	6.234	59	33.32	212
19.4	64.80	46	95.86	212	22.330	47	22.56	121	27.712	32	18.33	67	6.175	88	35.44	195
29.4	64.34	53	97.98	169	22.283	65	23.77	113	27.680	50	17.66	70	6.087	113	37.39	170
June 8.3	63.81	58	99.67	120	22.218	82	24.90	102	27.630	68	16.96	70	5.974	133	39.09	141
18.3	63.23	61	100.87	69	22.136	96	25.92	88	27.562	82	16.26	69	5.841	150	40.50	108
28.3	62.62	66	101.56	15	22.040	107	26.80	71	27.480	95	15.57	66	5.691	163	41.58	72
July 8.3	61.96	65	101.71	— 39	21.933	114	27.51	50	27.385	104	14.91	61	5.528	171	42.30	33
18.2	61.31	63	101.32	93	21.819	119	28.01	32	27.281	110	14.30	53	5.357	173	42.63	— 5
28.2	60.68	62	100.39	144	21.700	117	28.33	10	27.171	112	13.77	45	5.184	171	42.58	44
Aug. 7.2	60.06	58	98.95	192	21.583	114	28.43	— 13	27.059	109	13.32	34	5.013	164	42.14	84
17.2	59.48	52	97.03	236	21.469	103	28.30	37	26.950	100	12.98	21	4.849	151	41.30	122
27.1	58.96	46	94.67	278	21.366	87	27.93	61	26.850	84	12.77	7	4.698	131	40.08	159
Sept. 6.1	58.50	38	91.89	312	21.279	63	27.32	87	26.766	62	12.70	— 10	4.567	103	38.49	193
16.1	58.12	28	88.77	343	21.216	33	26.45	112	26.704	32	12.80	30	4.464	69	36.56	226
26.0	57.84	18	85.34	363	21.183	0	25.33	139	26.672	0	13.10	51	4.395	29	34.30	254
Oct. 6.0	57.66	5	81.71	380	21.183	42	23.94	162	26.672	42	13.61	76	4.366	— 19	31.76	279
16.0	57.61	— 5	77.91	387	21.225	87	22.32	188	26.714	87	14.37	100	4.385	69	28.97	300
26.0	57.66	18	74.04	386	21.312	132	20.44	209	26.801	133	15.37	126	4.454	123	25.97	314
Nov. 4.9	57.84	32	70.18	375	21.444	181	18.35	227	26.934	180	16.63	148	4.577	178	22.83	321
14.9	58.16	43	66.43	353	21.625	224	16.08	239	27.114	224	18.11	172	4.755	231	19.62	320
24.9	58.59	55	62.90	324	21.849	264	13.69	248	27.338	263	19.83	190	4.986	279	16.42	310
Dec. 4.9	59.14	64	59.66	283	22.113	297	11.21	246	27.601	295	21.73	202	5.265	320	13.32	294
14.8	59.78	73	56.83	233	22.410	322	8.75	241	27.896	317	23.75	212	5.585	353	10.38	265
24.8	60.51	79	54.50	177	22.732	333	6.34	226	28.213	331	25.87	210	5.938	372	7.73	229
34.8	61.30		52.73		23.065		4.08		28.544		27.97		6.310		5.41	
Mean Place	59.391		98.63		19.293		37.52		24.680		0.30		2.891		45.03	
Sec δ, Tan δ	3.386		+3.235		1.031		+0.253		1.000		−0.003		1.262		+0.770	
$D_\psi \alpha$, $D_\omega \alpha$	+0.03		+0.20		+0.06		+0.02		+0.06		0.00		+0.05		+0.05	
$D_\psi \delta$, $D_\omega \delta$	−0.4		−0.4		−0.4		−0.4		−0.4		−0.4		−0.4		−0.4	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ε Centauri. Mag. 2.6				m Virginis. Mag. 5.2				τ Boötis. Mag. 4.5				η Ursæ Majoris. (*Alkaid.*) Mag. 1.9			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	13 34		−53 2		13 37		− 8 16		13 43		+17 51		13 44		+49 43	
	s		″		s		″		s		″		s		″	
Jan. 0.8	33.353		15.60		12.487		51.93		16.683		75.32		14.372		32.64	
10.8	33.860	507	16.79	119	12.828	341	53.94	201	17.022	339	73.14	218	14.803	431	30.60	204
20.7	34.362	502	18.42	163	13.167	339	55.94	200	17.362	340	71.23	191	15.242	439	29.12	148
30.7	34.844	482	20.44	202	13.493	326	57.87	193	17.693	331	69.69	154	15.675	433	28.24	88
Feb. 9.7	35.295	451	22.77	233	13.799	306	59.67	180	18.004	311	68.53	116	16.085	410	27.97	27
19.7	35.707	412	25.36	259	14.079	280	61.27	160	18.291	287	67.80	73	16.464	379	28.32	35
29.6	36.073	366	28.12	276	14.327	248	62.67	140	18.545	254	67.49	31	16.800	336	29.25	93
Mar. 10.6	36.390	317	31.00	288	14.541	214	63.83	116	18.764	219	67.59	10	17.086	286	30.71	146
20.6	36.655	265	33.94	294	14.720	179	64.76	93	18.947	183	68.06	47	17.316	230	32.60	189
30.5	36.867	212	36.86	292	14.865	145	65.44	68	19.091	144	68.87	81	17.489	173	34.86	226
Apr. 9.5	37.027	160	39.72	286	14.977	112	65.91	47	19.200	109	69.95	108	17.604	115	37.38	252
19.5	37.137	110	42.46	274	15.057	80	66.16	25	19.274	74	71.22	127	17.663	59	40.04	266
29.5	37.198	61	45.03	257	15.109	52	66.25	9	19.317	43	72.63	141	17.669	6	42.74	270
May 9.4	37.213	15	47.40	237	15.134	25	66.18	7	19.329	12	74.11	148	17.626	43	45.39	265
19.4	37.182	31	49.50	210	15.135	1	65.96	22	19.315	14	75.60	149	17.539	87	47.88	249
29.4	37.109	73	51.33	183	15.112	23	65.65	31	19.277	38	77.04	144	17.413	126	50.14	226
June 8.4	36.998	111	52.81	148	15.069	43	65.25	40	19.217	60	78.39	135	17.252	161	52.09	195
18.3	36.851	147	53.94	113	15.007	62	64.78	47	19.137	80	79.59	120	17.064	188	53.68	159
28.3	36.672	179	54.68	74	14.928	79	64.25	53	19.041	96	80.62	103	16.852	212	54.87	119
July 8.3	36.468	204	55.02	34	14.836	92	63.69	56	18.931	110	81.45	83	16.624	228	55.63	76
18.2	36.245	223	54.95	7	14.732	104	63.11	58	18.809	122	82.05	60	16.385	239	55.93	30
28.2	36.012	233	54.47	48	14.621	111	62.51	60	18.681	128	82.42	37	16.141	244	55.77	16
Aug. 7.2	35.776	236	53.59	88	14.506	115	61.93	58	18.551	130	82.53	11	15.898	243	55.15	62
17.2	35.548	228	52.34	125	14.394	112	61.38	55	18.423	128	82.38	15	15.664	234	54.07	108
27.1	35.340	208	50.76	158	14.290	104	60.88	50	18.304	119	81.96	42	15.446	218	52.55	152
Sept. 6.1	35.163	177	48.91	185	14.200	90	60.46	42	18.199	105	81.26	70	15.251	195	50.62	193
16.1	35.028	135	46.83	208	14.134	66	60.17	29	18.114	85	80.30	96	15.089	162	48.31	231
26.1	34.945	83	44.64	219	14.097	37	60.02	15	18.059	55	79.05	125	14.966	123	45.64	267
Oct. 6.0	34.925	20	42.39	225	14.093	4	60.05	3	18.038	21	77.52	153	14.891	75	42.66	298
16.0	34.976	51	40.21	218	14.132	39	60.30	25	18.057	19	75.75	177	14.870	21	39.45	321
26.0	35.100	124	38.18	203	14.216	84	60.79	49	18.121	64	73.72	203	14.909	39	36.04	341
Nov. 4.9	35.302	202	36.39	179	14.347	131	61.55	76	18.233	112	71.48	224	15.013	104	32.51	353
14.9	35.578	276	34.92	147	14.526	179	62.56	101	18.393	160	69.07	241	15.181	168	28.94	357
24.9	35.921	343	33.86	106	14.750	224	63.84	128	18.600	207	66.54	253	15.414	233	25.44	350
Dec. 4.9	36.324	403	33.26	60	15.014	264	65.35	151	18.850	250	63.93	261	15.706	292	22.08	336
14.8	36.775	451	33.15	11	15.311	297	67.07	172	19.135	285	61.36	257	16.051	345	18.98	310
24.8	37.258	483	33.54	39	15.632	321	68.94	187	19.448	313	58.87	249	16.438	387	16.22	276
34.8	37.760	502	34.42	88	15.967	385	70.90	196	19.779	331	56.55	282	16.854	416	13.88	234
Mean Place	33.348		23.50		12.055		46.32		16.220		89.81		13.973		55.60	
Sec δ, Tan δ	1.664		−1.329		1.011		−0.146		1.050		+0.322		1.547		+1.181	
$D_\psi \alpha$, $D_\omega \alpha$	+0.08		−0.08		+0.06		−0.01		+0.06		+0.02		+0.05		+0.07	
$D_\psi \delta$, $D_\omega \delta$	−0.4		−0.4		−0.4		−0.4		−0.4		−0.4		−0.4		−0.4	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	89 Virginis. Mag. 5.1 Right Ascension.		89 Virginis. Declination.		ζ Centauri. Mag. 3.1 Right Ascension.		ζ Centauri. Declination.		η Boötis. Mag. 2.8 Right Ascension.		η Boötis. Declination.		θ Apodis. Var. 5.5–6.6 Right Ascension.		θ Apodis. Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	13 45		−17 42		13 50		−46 52		13 50		+18 48		13 57		−76 23	
	s		″		s		″		s		″		s		″	
Jan. 0.8	18.577	353	60.68	184	17.523	458	25.61	116	41.525	339	51.30	222	4.20	114	20.31	24
10.8	18.930	349	62.52	193	17.981	456	26.77	154	41.864	341	49.08	194	5.34	114	20.55	85
20.7	19.279	340	64.45	197	18.437	443	28.31	186	42.205	334	47.14	157	6.48	112	21.40	139
30.7	19.619	320	66.42	193	18.880	419	30.17	216	42.539	317	45.57	117	7.60	106	22.79	188
Feb. 9.7	19.939	292	68.35	186	19.299	386	32.33	235	42.856	291	44.40	74	8.66	100	24.67	233
19.7	20.231	262	70.21	174	19.685	348	34.68	251	43.147	260	43.66	30	9.66	90	27.00	271
29.6	20.493	229	71.95	156	20.033	306	37.19	261	43.407	226	43.36	12	10.56	80	29.71	301
Mar. 10.6	20.722	194	73.51	139	20.339	261	39.80	262	43.633	191	43.48	49	11.36	68	32.72	323
20.6	20.916	159	74.90	120	20.600	216	42.42	260	43.824	153	43.97	85	12.04	56	35.95	342
30.6	21.075	126	76.10	101	20.816	171	45.02	253	43.977	117	44.82	112	12.60	42	39.37	346
Apr. 9.5	21.201	95	77.11	82	20.987	127	47.55	242	44.094	82	45.94	132	13.02	29	42.83	350
19.5	21.296	64	77.93	63	21.114	85	49.97	227	44.176	50	47.26	147	13.31	16	46.33	342
29.5	21.360	36	78.56	46	21.199	44	52.24	208	44.226	19	48.73	154	13.47	2	49.75	328
May 9.4	21.396	9	79.02	30	21.243	3	54.32	186	44.245	7	50.27	155	13.49	11	53.03	310
19.4	21.405	15	79.32	15	21.246	36	56.18	160	44.238	34	51.82	150	13.38	24	56.13	285
29.4	21.390	38	79.47	0	21.210	71	57.78	131	44.204	56	53.32	140	13.14	35	58.98	248
June 8.4	21.352	58	79.47	14	21.139	104	59.09	101	44.148	77	54.72	126	12.79	47	61.46	210
18.3	21.294	79	79.33	27	21.035	134	60.10	67	44.071	94	55.98	106	12.32	56	63.56	167
28.3	21.215	96	79.06	38	20.901	160	60.77	32	43.977	109	57.04	87	11.76	64	65.23	120
July 8.3	21.119	108	78.68	50	20.741	180	61.09	2	43.868	123	57.91	63	11.12	70	66.43	66
18.3	21.011	119	78.18	60	20.561	195	61.07	40	43.745	129	58.54	39	10.42	74	67.09	14
28.2	20.892	123	77.58	69	20.366	201	60.67	75	43.616	134	58.93	11	9.68	75	67.23	40
Aug. 7.2	20.769	121	76.89	74	20.165	198	59.92	108	43.482	132	59.04	15	8.93	73	66.83	94
17.2	20.648	114	76.15	77	19.967	187	58.84	136	43.350	125	58.89	43	8.20	69	65.89	143
27.1	20.534	100	75.38	77	19.780	163	57.48	162	43.225	110	58.46	72	7.51	61	64.46	189
Sept. 6.1	20.434	76	74.61	72	19.617	129	55.86	180	43.115	91	57.74	99	6.90	50	62.57	228
16.1	20.358	48	73.89	64	19.488	85	54.06	192	43.024	63	56.75	129	6.40	37	60.29	260
26.1	20.310	10	73.25	51	19.403	33	52.14	196	42.961	29	55.46	156	6.03	22	57.69	280
Oct. 6.0	20.300	33	72.74	32	19.370	28	50.18	190	42.932	12	53.90	182	5.81	5	54.89	293
16.0	20.333	81	72.42	11	19.398	95	48.28	177	42.944	56	52.08	208	5.76	14	51.96	292
26.0	20.414	131	72.31	16	19.493	162	46.51	155	43.000	104	50.00	228	5.90	32	49.04	280
Nov. 5.0	20.545	180	72.47	44	19.655	231	44.96	124	43.104	153	47.72	247	6.22	51	46.24	256
14.9	20.725	228	72.91	74	19.886	294	43.72	88	43.257	201	45.25	259	6.73	68	43.68	220
24.9	20.953	270	73.65	102	20.180	350	42.84	48	43.458	244	42.66	264	7.41	82	41.48	178
Dec. 4.9	21.223	306	74.67	130	20.530	396	42.36	2	43.702	281	40.02	263	8.23	95	39.70	126
14.8	21.529	330	75.97	155	20.926	429	42.34	43	43.983	311	37.39	253	9.18	105	38.44	72
24.8	21.859	346	77.52	173	21.355	451	42.77	87	44.294	330	34.86	236	10.23	111	37.72	12
34.8	22.205		79.25		21.806		43.64		44.624		32.50		11.34		37.60	
Mean Place	18.232		58.11		17.497		31.56		41.111		66.09		5.955		31.31	
Sec δ, Tan δ	1.050		−0.320		1.463		−1.068		1.056		+0.341		4.251		−4.132	
$D_\psi \alpha$, $D_\omega \alpha$	+0.06		−0.02		+0.07		−0.06		+0.06		+0.02		+0.11		−0.24	
$D_\psi \delta$, $D_\omega \delta$	−0.4		−0.4		−0.4		−0.5		−0.4		−0.5		−0.3		−0.5	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	11 Boötis. Mag. 6.1				τ Virginis. Mag. 4.3				β Centauri. Mag. 0.9				π Hydræ. Mag. 3.5		
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Decli- tion
	h m 13 57		° ′ +27 46		h m 13 57		° ′ + 1 56		h m 13 57		° ′ −59 57		h m 14 1		° −26
	s		″		s		″		s		″		s		″
Jan. 0.8	22.367		73.05		22.570		52.73		52.660		57.48		35.239		41.91
10.8	22.716	349	70.78	227	22.902	332	50.63	210	53.250	590	58.18	70	35.607	368	43.46
20.7	23.071	355	68.89	189	23.236	334	48.65	198	53.840	590	59.37	119	35.977	370	45.20
30.7	23.418	347	67.45	144	23.562	326	46.86	179	54.417	577	61.01	164	36.337	360	47.07
Feb. 9.7	23.750	332	66.48	97	23.872	310	45.31	155	54.966	549	63.04	203	36.680	343	49.01
19.7	24.057	307	66.03	45	24.159	287	44.04	127	55.476	510	65.39	235	36.998	318	50.97
29.6	24.335	278	66.06	3	24.416	257	43.06	98	55.939	463	68.01	262	37.287	289	52.89
Mar. 10.6	24.576	241	66.57	51	24.644	228	42.40	66	56.349	410	70.83	282	37.542	255	54.74
20.6	24.778	202	67.49	92	24.837	193	42.05	35	56.702	353	73.78	295	37.763	221	56.48
30.6	24.941	163	68.79	130	24.997	160	41.97	8	56.994	292	76.79	301	37.950	187	58.07
Apr. 9.5	25.064	123	70.39	160	25.124	127	42.15	18	57.225	231	79.81	302	38.102	152	59.53
19.5	25.150	86	72.19	180	25.221	97	42.54	39	57.397	172	82.79	298	38.220	118	60.82
29.5	25.200	50	74.11	192	25.287	66	43.10	56	57.508	111	85.65	286	38.307	87	61.94
May 9.4	25.216	16	76.09	198	25.327	40	43.79	69	57.559	51	88.35	270	38.362	55	62.89
19.4	25.201	15	78.04	195	25.340	13	44.57	78	57.552	7	90.83	248	38.388	26	63.65
29.4	25.159	42	79.90	186	25.329	11	45.40	83	57.490	62	93.04	221	38.387	1	64.25
June 8.4	25.090	69	81.59	169	25.295	34	46.23	83	57.374	116	94.95	191	38.357	30	64.67
18.3	24.999	91	83.08	149	25.241	54	47.06	83	57.209	165	96.50	155	38.304	53	64.89
28.3	24.887	112	84.32	124	25.167	74	47.84	78	57.000	209	97.67	117	38.226	78	64.94
July 8.3	24.760	127	85.28	96	25.078	89	48.55	71	56.753	247	98.41	74	38.128	98	64.81
18.3	24.620	140	85.93	65	24.975	103	49.20	65	56.477	276	98.72	31	38.013	115	64.48
28.2	24.471	149	86.26	33	24.861	114	49.75	55	56.181	296	98.58	14	37.884	129	63.98
Aug. 7.2	24.317	154	86.26	0	24.741	120	50.19	44	55.874	307	97.99	59	37.747	137	63.32
17.2	24.165	152	85.91	35	24.621	120	50.50	31	55.573	301	96.97	102	37.609	138	62.52
27.1	24.020	145	85.21	70	24.507	114	50.66	16	55.287	286	95.56	141	37.477	132	61.60
Sept. 6.1	23.888	132	84.18	103	24.404	103	50.66	0	55.034	253	93.78	178	37.358	119	60.60
16.1	23.779	109	82.83	135	24.319	85	50.47	19	54.827	207	91.71	207	37.261	97	59.57
26.1	23.698	81	81.15	168	24.262	57	50.09	38	54.681	146	89.43	228	37.196	65	58.54
Oct. 6.0	23.651	47	79.16	199	24.238	24	49.48	61	54.605	76	87.00	243	37.168	28	57.59
16.0	23.646	5	76.90	226	24.253	15	48.64	84	54.612	7	84.56	244	37.185	17	56.76
26.0	23.689	43	74.39	251	24.312	59	47.56	108	54.708	96	82.18	238	37.253	68	56.12
Nov. 5.0	23.782	93	71.69	270	24.418	106	46.24	132	54.896	188	79.99	219	37.375	122	55.70
14.9	23.927	145	68.83	286	24.571	153	44.68	156	55.174	278	78.05	194	37.549	174	55.57
24.9	24.122	195	65.90	293	24.771	200	42.91	177	55.537	363	76.48	157	37.775	226	55.75
Dec. 4.9	24.364	242	62.96	294	25.014	243	40.98	193	55.975	438	75.34	114	38.048	273	56.25
14.8	24.645	281	60.09	287	25.291	277	38.92	206	56.475	500	74.68	66	38.360	312	57.07
24.8	24.961	316	57.39	270	25.597	306	36.79	213	57.022	547	74.52	16	38.701	341	58.20
34.8	25.298	337	54.95	244	25.920	323	34.69	210	57.600	578	74.89	37	39.061	360	59.58
Mean Place	22.007		90.50		22.216		62.06		53.025		66.04		35.034		41.74
Sec δ, Tan δ	1.130		+0.527		1.001		+0.034		1.998		−1.730		1.115		−0.49
$D_\psi \alpha$, $D_\omega \alpha$	+0.05		+0.03		+0.06		0.00		+0.08		−0.10		+0.07		−0.03
$D_\psi \delta$, $D_\omega \delta$	−0.3		−0.5		−0.3		−0.5		−0.3		−0.5		−0.3		−0.5

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	θ Centauri. Mag. 2.3				α Draconis. Mag. 3.6				d Boötis. Mag. 4.8				κ Virginis. Mag. 4.3			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	14 1		−35 57		14 2		+64 45		14 6		+25 28		14 8		− 9 52	
	s		″		s		″		s		″		s		″	
Jan. 0.8	44.113		23.33		6.85		72.14		34.425		63.71		25.020		65.28	
10.8	44.512	399	24.65	132	7.42	57	70.13	201	34.767	342	61.40	231	25.357	337	67.15	187
20.8	44.911	399	26.27	162	8.02	60	68.73	140	35.115	348	59.45	195	25.698	341	69.03	188
30.7	45.302	391	28.11	184	8.62	60	67.98	75	35.460	345	57.91	154	26.031	333	70.86	183
Feb. 9.7	45.673	371	30.12	201	9.20	58	67.91	7	35.790	330	56.84	107	26.351	320	72.59	173
19.7	46.017	344	32.25	213	9.74	54	68.48	57	36.098	308	56.25	59	26.648	297	74.15	156
29.6	46.329	312	34.44	219	10.23	49	69.69	121	36.377	279	56.15	10	26.917	269	75.52	137
Mar. 10.6	46.607	278	36.63	219	10.66	43	71.46	177	36.622	245	56.52	37	27.158	241	76.67	115
20.6	46.847	240	33.79	216	11.01	35	73.70	224	36.831	209	57.32	80	27.366	208	77.61	94
30.6	47.048	201	40.86	207	11.26	25	76.33	263	37.001	170	58.49	117	27.542	176	78.31	70
Apr. 9.5	47.212	164	42.83	197	11.43	17	79.21	288	37.134	133	59.96	147	27.687	145	78.80	49
19.5	47.340	128	44.68	185	11.52	9	82.24	303	37.231	97	61.66	170	27.800	113	79.08	28
29.5	47.432	92	46.36	168	11.51	1	85.29	305	37.292	61	63.50	184	27.885	85	79.20	12
May 9.5	47.489	57	47.87	151	11.43	8	88.28	299	37.320	28	65.40	190	27.941	56	79.17	3
19.4	47.513	24	49.19	132	11.26	17	91.08	280	37.318	2	67.31	191	27.970	29	79.01	16
29.4	47.506	7	50.29	110	11.03	23	93.60	252	37.287	31	69.13	182	27.974	4	78.73	28
June 8.4	47.467	39	51.18	89	10.74	29	95.76	216	37.230	57	70.82	169	27.952	22	78.38	35
18.3	47.399	68	51.82	64	10.41	33	97.52	176	37.149	81	72.33	151	27.909	43	77.96	42
28.3	47.305	94	52.21	39	10.03	38	98.83	131	37.048	101	73.60	127	27.843	66	77.48	48
July 8.3	47.186	119	52.33	12	9.63	40	99.64	81	36.927	121	74.62	102	27.759	84	76.96	52
18.3	47.049	137	52.18	15	9.20	43	99.93	29	36.793	134	75.34	72	27.659	100	76.42	54
28.2	46.897	152	51.78	40	8.76	44	99.71	22	36.648	145	75.77	43	27.545	114	75.86	56
Aug. 7.2	46.737	160	51.12	66	8.33	43	98.96	75	36.498	150	75.87	10	27.423	122	75.29	57
17.2	46.576	161	50.23	89	7.90	43	97.71	125	36.347	151	75.64	23	27.299	124	74.75	54
27.2	46.421	155	49.12	111	7.50	40	95.98	173	36.201	146	75.08	56	27.180	119	74.24	51
Sept. 6.1	46.282	139	47.86	126	7.14	36	93.79	219	36.067	134	74.18	90	27.070	110	73.79	45
16.1	46.170	112	46.48	138	6.81	33	91.18	261	35.954	113	72.96	122	26.978	92	73.43	36
26.1	46.092	78	45.04	144	6.55	26	88.21	297	35.866	88	71.43	153	26.913	65	73.20	23
Oct. 6.0	46.057	35	43.61	143	6.36	19	84.93	328	35.813	53	69.60	183	26.882	31	73.13	7
16.0	46.072	15	42.27	134	6.24	12	81.39	354	35.801	12	67.47	213	26.890	8	73.24	11
26.0	46.144	72	41.08	119	6.21	3	77.68	371	35.835	34	65.11	236	26.944	54	73.57	33
Nov. 5.0	46.274	130	40.10	98	6.26	5	73.87	381	35.918	83	62.51	260	27.046	102	74.14	57
14.9	46.464	190	39.41	69	6.41	15	70.05	382	36.052	134	59.76	275	27.197	151	74.98	84
24.9	46.709	245	39.06	35	6.66	25	66.33	372	36.237	185	56.91	285	27.396	199	76.07	109
Dec. 4.9	47.005	296	39.05	1	7.01	35	62.80	353	36.469	232	54.03	288	27.639	243	77.38	131
14.9	47.343	338	39.42	37	7.43	42	59.56	324	36.743	274	51.20	283	27.918	279	78.91	153
24.8	47.712	369	40.17	75	7.92	49	56.73	283	37.050	307	48.50	270	28.228	310	80.61	170
34.8	48.101	389	41.28	111	8.46	54	54.40	233	37.379	329	46.04	246	28.556	328	82.42	181
Mean Place	43.998		26.03		6.929		97.27		34.127		80.44		24.758		59.74	
Sec δ, Tan δ	1.235		−0.726		2.346		+2.122		1.108		+0.477		1.015		−0.174	
$D_\phi \alpha$, $D_\omega \alpha$	+0.07		−0.04		+0.03		+0.12		+0.05		+0.03		+0.06		−0.01	
$D_\phi \delta$, $D_\omega \delta$	−0.3		−0.5		−0.3		−0.5		−0.3		−0.5		−0.3		−0.5	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	**4 Ursæ Minoris.** Mag. 5.0				**ι Virginis.** Mag. 4.2				**α Boötis.** (*Arcturus.*) Mag. 0.2				**λ Boötis.** Mag. 4.3			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	14 9		+77 55		14 11		− 5 36		14 11		+19 36		14 13		+46 27	
	s		″		s		″		s		″		s		″	
Jan. 0.8	8.10	103	65.77	185	36.707	333	7.54	195	50.040	330	54.23	235	11.641	398	62.99	231
10.8	9.13	108	63.92	123	37.040	336	9.49	193	50.370	338	51.88	205	12.039	411	60.68	181
20.8	10.21	111	62.69	55	37.376	331	11.42	182	50.708	334	49.83	168	12.450	412	58.87	124
30.7	11.32	109	62.14	— 11	37.707	317	13.24	167	51.042	321	48.15	128	12.862	400	57.63	64
Feb. 9.7	12.41	104	62.25	79	38.024	295	14.91	148	51.363	299	46.87	84	13.262	376	56.99	0
19.7	13.45	93	63.04	142	38.319	269	16.39	123	51.662	273	46.03	38	13.638	342	56.99	58
29.6	14.38	82	64.46	196	38.588	240	17.62	99	51.935	241	45.65	— 5	13.980	300	57.57	114
Mar. 10.6	15.20	65	66.42	243	38.828	208	18.61	72	52.176	206	45.70	45	14.280	254	58.71	164
20.6	15.85	49	68.85	278	39.036	176	19.33	48	52.382	171	46.15	82	14.534	203	60.35	205
30.6	16.34	29	71.63	304	39.212	145	19.81	24	52.553	137	46.97	112	14.737	152	62.40	236
Apr. 9.5	16.63	12	74.67	315	39.357	114	20.05	5	52.690	101	48.09	135	14.889	100	64.76	258
19.5	16.75	— 7	77.82	315	39.471	85	20.10	— 13	52.791	68	49.44	151	14.989	50	67.34	269
29.5	16.68	26	80.97	304	39.556	57	19.97	29	52.859	38	50.95	160	15.039	3	70.03	269
May 9.5	16.42	41	84.01	283	39.613	30	19.68	38	52.897	7	52.55	162	15.042	— 41	72.72	260
19.4	16.01	56	86.84	252	39.643	5	19.30	48	52.904	— 20	54.17	159	15.001	82	75.32	244
29.4	15.45	70	89.36	214	39.648	— 21	18.82	53	52.884	45	55.76	149	14.919	119	77.76	219
June 8.4	14.75	80	91.50	170	39.627	42	18.29	57	52.839	69	57.25	135	14.800	151	79.95	188
18.3	13.95	89	93.20	122	39.585	65	17.72	60	52.770	89	58.60	116	14.649	177	81.83	151
28.3	13.06	94	94.42	69	39.520	82	17.12	59	52.681	108	59.76	95	14.472	200	83.34	110
July 8.3	12.12	99	95.11	15	39.438	100	16.53	58	52.573	125	60.71	70	14.272	219	84.44	68
18.3	11.13	101	95.26	— 38	39.338	112	15.95	56	52.448	135	61.41	46	14.053	231	85.12	23
28.2	10.12	100	94.88	92	39.226	122	15.39	51	52.313	142	61.87	17	13.822	235	85.35	— 22
Aug. 7.2	9.12	97	93.96	144	39.104	124	14.88	46	52.171	144	62.04	— 11	13.587	234	85.13	68
17.2	8.15	92	92.52	192	38.980	120	14.42	38	52.027	141	61.93	39	13.353	226	84.45	113
27.2	7.23	85	90.60	236	38.860	112	14.04	27	51.886	129	61.54	70	13.127	209	83.32	156
Sept. 6.1	6.38	76	88.24	278	38.748	93	13.77	15	51.757	111	60.84	98	12.918	184	81.76	197
16.1	5.62	63	85.46	313	38.655	68	13.62	1	51.646	86	59.86	130	12.734	150	79.79	234
26.1	4.99	51	82.33	343	38.587	35	13.61	— 18	51.560	54	58.56	158	12.584	108	77.45	269
Oct. 6.0	4.48	36	78.90	365	38.552	— 4	13.79	38	51.506	14	56.98	185	12.476	58	74.76	299
16.0	4.12	18	75.25	380	38.556	49	14.17	61	51.492	— 31	55.13	211	12.418	1	71.77	322
26.0	3.94	2	71.45	386	38.605	96	14.78	84	51 523	78	53.02	234	12.417	— 58	68.55	340
Nov. 5.0	3.92	— 17	67.59	383	38.701	145	15.62	110	51.601	129	50.68	253	12.475	122	65.15	349
14.9	4.09	36	63.76	372	38.846	192	16.72	132	51.730	178	48.15	265	12.597	186	61.66	351
24.9	4.45	53	60.04	347	39.038	236	18.04	154	51.908	224	45.50	273	12.733	245	58.15	343
Dec. 4.9	4.98	70	56.57	316	39.274	273	19.58	173	52.132	264	42.77	272	13.028	300	54.72	325
14.9	5.68	85	53.41	272	39.547	304	21.31	185	52.396	297	40.05	264	13.328	346	51.47	296
24.8	6.53	96	50.69	220	39.851	322	23.16	193	52.693	319	37.41	247	13.674	379	48.51	258
34.8	7.49		48.49		40.173		25.09		53.012		34.94		14.053		45.93	
Mean Place	9.331		91.80		36.449		0.56		49.765		69.21		11.522		84.87	
Sec δ, Tan δ	4.785		+4.680		1.005		−0.098		1.062		+0.356		1.452		+1.053	
Dψ α, Dω α	−0.01		+0.26		+0.06		−0.01		+0.06		+0.02		+0.05		+0.06	
Dψ δ, Dω δ	−0.3		−0.5		−0.3		−0.5		−0.3		−0.5		−0.3		−0.5	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	λ Virginis. Mag. 4.6				2 Libræ. Mag. 6.3				θ Boötis. Mag. 4.1				f Boötis. Mag. 5.4			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	14 14		−12 59		14 18		−11 19		14 22		+52 13		14 22		+19 35	
	s		″		s		″		s		″		s		″	
Jan. 0.8	33.889		10.65		54.455		56.55		20.223		56.14		33.118		59.48	
10.8	34.229	340	12.44	179	54.792	337	58.36	181	20.645	422	53.75	239	33.447	329	57.15	233
20.8	34.571	342	14.24	180	55.135	343	60.19	183	21.089	444	51.91	184	33.785	338	55.12	203
30.7	34.910	339	16.06	182	55.471	336	61.98	179	21.535	446	50.67	124	34.121	336	53.44	168
Feb. 9.7	35.234	324	17.81	175	55.794	323	63.69	171	21.974	439	50.05	62	34.445	324	52.18	126
19.7	35.537	303	19.41	160	56.096	302	65.26	157	22.390	416	50.09	4	34.751	306	51.36	82
29.7	35.813	276	20.86	145	56.375	279	66.65	139	22.771	381	50.75	66	35.031	280	51.00	36
Mar. 10.6	36.062	249	22.13	127	56.624	249	67.84	119	23.108	337	51.99	124	35.281	250	51.08	8
20.6	36.276	214	23.19	106	56.842	218	68.81	97	23.394	286	53.75	176	35.499	218	51.57	49
30.6	36.461	185	24.05	86	57.029	187	69.56	75	23.623	229	55.93	218	35.682	183	52.43	86
Apr. 9.5	36.615	154	24.70	65	57.184	155	70.11	55	23.796	173	58.45	252	35.830	148	53.60	117
19.5	36.737	122	25.18	48	57.310	126	70.46	35	23.910	114	61.18	273	35.945	115	55.01	141
29.5	36.828	91	25.47	29	57.405	95	70.65	19	23.967	57	64.03	285	36.026	81	56.61	160
May 9.5	36.893	65	25.62	15	57.472	67	70.68	3	23.968	1	66.88	285	36.076	50	58.30	169
19.4	36.927	34	25.61	1	57.511	39	70.59	9	23.917	51	69.65	277	36.096	20	60.01	171
29.4	36.939	12	25.51	10	57.525	14	70.40	19	23.819	98	72.23	258	36.086	10	61.70	169
June 8.4	36.922	17	25.30	21	57.511	14	70.11	29	23.678	141	74.55	232	36.050	36	63.29	159
18.4	36.880	42	25.00	30	57.474	37	69.75	36	23.499	179	76.53	198	35.990	60	64.75	146
28.3	36.820	60	24.64	36	57.415	59	69.33	42	23.286	213	78.13	160	35.907	83	66.04	129
July 8.3	36.736	84	24.19	45	57.334	81	68.85	48	23.047	239	79.30	117	35.804	103	67.11	107
18.3	36.635	101	23.69	50	57.235	99	68.34	51	22.785	262	80.02	72	35.683	121	67.93	82
28.2	36.519	116	23.15	54	57.121	114	67.81	53	22.511	274	80.26	24	35.550	133	68.49	56
Aug. 7.2	36.397	122	22.58	57	56.999	122	67.26	55	22.228	283	80.01	25	35.407	143	68.78	29
17.2	36.270	127	22.00	58	56.870	129	66.72	54	21.946	282	79.29	72	35.260	147	68.79	1
27.2	36.144	126	21.43	57	56.744	126	66.19	53	21.673	273	78.09	120	35.115	145	68.51	28
Sept. 6.1	36.029	115	20.87	56	56.627	117	65.71	48	21.419	254	76.43	166	34.980	135	67.93	58
16.1	35.933	96	20.40	47	56.528	99	65.32	39	21.190	229	74.35	208	34.862	118	67.04	89
26.1	35.862	71	20.02	38	56.454	74	65.03	29	20.999	191	71.88	247	34.769	93	65.86	118
Oct. 6.1	35.826	36	19.79	23	56.413	41	64.87	16	20.852	147	69.05	283	34.708	61	64.37	149
16.0	35.828	2	19.73	6	56.412	1	64.90	3	20.761	91	65.91	314	34.684	24	62.60	177
26.0	35.877	49	19.85	12	56.455	43	65.14	24	20.730	31	62.53	338	34.704	20	60.57	203
Nov. 5.0	35.975	98	20.23	38	56.547	92	65.61	47	20.765	35	58.97	356	34.773	69	58.31	226
14.9	36.123	148	20.85	62	56.689	142	66.33	72	20.872	107	55.32	365	34.893	120	55.86	245
24.9	36.319	196	21.75	90	56.880	191	67.30	97	21.048	176	51.67	365	35.062	169	53.26	260
Dec. 4.9	36.561	242	22.86	111	57.116	236	68.51	121	21.293	245	48.12	355	35.279	217	50.59	267
14.9	36.841	280	24.23	137	57.392	276	69.93	142	21.599	306	44.75	337	35.536	257	47.92	267
24.8	37.149	308	25.79	156	57.698	306	71.53	160	21.958	359	41.70	305	35.826	290	45.31	261
34.8	37.479	330	27.49	170	58.024	326	73.26	173	22.359	401	39.05	265	36.142	316	42.86	245
Mean Place	33.671		6.04		54.254		51.36		20.286		78.90		32.913		74.39	
Sec δ, Tan δ	1.026		−0.231		1.020		−0.200		1.632		+1.291		1.061		+0.356	
$D_\psi \alpha$, $D_\omega \alpha$	+0.06		−0.01		+0.07		−0.01		+0.04		+0.07		+0.06		+0.02	
$D_\psi \delta$, $D_\omega \delta$	−0.3		−0.6		−0.3		−0.6		−0.3		−0.6		−0.3		−0.8	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	φ Virginis. Mag. 5.0				5 Ursæ Minoris. Mag. 4.4				ρ Boötis. Mag. 3.8				γ Boötis. Mag. 3.0			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 14 23		° ′ − 1 51		h m 14 27		° ′ +76 3		h m 14 28		° ′ +30 43		h m 14 28		° ′ +38 39	
	s		″		s		″		s		″		s		″	
Jan. 0.8	52.572		15.20		39.60		44.76		12.743		64.69		41.839		70.88	
10.8	52.898	326	17.19	199	40.47	87	42.65	211	13.083	340	62.26	243	42.199	360	68.42	246
20.8	53.229	331	19.10	191	41.41	94	41.15	150	13.437	354	60.22	204	42.572	373	66.41	201
30.7	53.558	329	20.88	178	42.37	96	40.31	84	13.790	353	58.63	159	42.949	377	64.91	150
Feb. 9.7	53.876	318	22.47	159	43.34	97	40.16	15	14.135	345	57.55	108	43.317	368	63.98	93
19.7	54.174	298	23.82	135	44.27	93	40.68	52	14.461	326	56.99	56	43.665	348	63.62	36
29.7	54.448	274	24.90	108	45.12	85	41.83	115	14.761	300	56.96	3	43.988	323	63.84	22
Mar. 10.6	54.694	246	25.70	80	45.88	76	43.58	175	15.030	269	57.46	50	44.274	286	64.61	77
20.6	54.911	217	26.22	52	46.51	63	45.83	225	15.264	234	58.41	95	44.522	248	65.88	127
30.6	55.096	185	26.46	24	47.01	50	48.50	267	15.459	195	59.78	137	44.728	206	67.58	170
Apr. 9.6	55.250	154	26.46	0	47.34	33	51.46	296	15.615	156	61.49	171	44.890	162	69.62	204
19.5	55.374	124	26.24	22	47.52	18	54.57	311	15.734	119	63.44	195	45.009	119	71.91	229
29.5	55.469	95	25.85	39	47.54	2	57.75	318	15.814	80	65.57	213	45.086	77	74.35	244
May 9.5	55.535	66	25.32	53	47.40	14	60.89	314	15.859	45	67.78	221	45.121	35	76.87	252
19.4	55.574	39	24.68	64	47.12	28	63.85	296	15.869	10	69.99	221	45.118	3	79.35	248
29.4	55.586	12	23.97	71	46.70	42	66.55	270	15.847	22	72.10	211	45.078	40	81.72	237
June 8.4	55.572	14	23.23	74	46.16	54	68.90	235	15.795	52	74.08	198	45.003	75	83.88	216
18.4	55.536	36	22.48	75	45.51	65	70.85	195	15.714	81	75.86	178	44.898	105	85.81	193
28.3	55.477	59	21.75	73	44.79	72	72.34	149	15.609	105	77.37	151	44.767	131	87.42	161
July 8.3	55.397	80	21.06	69	43.99	80	73.34	100	15.481	128	78.60	123	44.610	157	88.69	127
18.3	55.299	98	20.41	65	43.15	84	73.79	45	15.335	146	79.50	90	44.436	174	89.58	89
28.3	55.186	113	19.83	58	42.28	87	73.73	6	15.173	162	80.05	55	44.246	190	90.08	50
Aug. 7.2	55.063	123	19.33	50	41.40	88	73.12	61	15.004	169	80.23	18	44.046	200	90.15	7
17.2	54.936	127	18.92	41	40.54	86	71.98	114	14.830	174	80.05	18	43.844	202	89.81	34
27.2	54.809	127	18.64	28	39.71	83	70.35	163	14.659	171	79.49	56	43.646	198	89.05	76
Sept. 6.1	54.692	117	18.47	17	38.93	78	68.24	211	14.498	161	78.57	92	43.458	188	87.87	118
16.1	54.589	103	18.46	1	38.22	71	65.70	254	14.354	144	77.28	129	43.291	167	86.29	158
26.1	54.511	78	18.63	17	37.60	62	62.77	293	14.236	118	75.63	165	43.151	140	84.34	195
Oct. 6.1	54.462	49	18.98	35	37.10	50	59.50	327	14.152	84	73.66	197	43.048	103	82.05	229
16.0	54.453	9	19.55	57	36.72	38	55.97	353	14.108	44	71.39	227	42.988	60	79.43	262
26.0	54.486	33	20.35	80	36.48	24	52.26	371	14.110	2	68.83	256	42.978	10	76.55	288
Nov. 5.0	54.567	81	21.39	104	36.40	8	48.42	384	14.164	54	66.05	278	43.024	46	73.44	311
15.0	54.698	131	22.67	128	36.48	8	44.58	384	14.271	107	63.11	294	43.126	102	70.20	324
24.9	54.876	178	24.15	148	36.72	24	40.81	377	14.433	162	60.05	306	43.287	161	66.88	332
Dec. 4.9	55.099	223	25.85	170	37.13	41	37.21	360	14.645	212	56.97	308	43.503	216	63.58	330
14.9	55.360	261	27.68	183	37.68	55	33.91	330	14.903	258	53.97	300	43.769	266	60.38	320
24.8	55.653	293	29.61	193	38.38	70	30.98	293	15.199	296	51.11	286	44.078	309	57.41	297
34.8	55.968	315	31.59	198	39.18	80	28.55	243	15.524	325	48.50	261	44.420	342	54.74	267
Mean Place	52.369		6.92		41.140		70.14		12.622		82.61		41.783		90.73	
Sec δ, Tan δ	1.001		−0.032		4.152		+4.030		1.163		+0.595		1.281		+0.800	
$D_\psi \alpha$, $D_\omega \alpha$	+0.06		0.00		0.00		+0.22		+0.05		+0.03		+0.05		+0.04	
$D_\psi \delta$, $D_\omega \delta$	−0.3		−0.6		−0.3		−0.6		−0.3		−0.6		−0.3		−0.6	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	η Centauri. Mag. 2.6				σ Boötis. Mag. 4.5				α² Centauri. Mag. 0.3				33 Boötis. Mag. 5.4			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 14 30		° ′ −41 47		h m 14 31		° ′ +30 6		h m 14 33		° ′ −60 29		h m 14 35		° ′ +44 45	
	s		″		s		″		s		″		s		″	
Jan. 0.8	9.919	419	18.58	85	1.526	339	16.61	244	53.10	58	8.11	28	42.657	375	38.20	251
10.8	10.338	428	19.43	118	1.865	352	14.17	206	53.68	59	8.39	75	43.032	393	35.69	202
20.8	10.766	425	20.61	147	2.217	352	12.11	161	54.27	59	9.14	120	43.425	400	33.67	148
30.7	11.191	411	22.08	172	2.569	343	10.50	111	54.86	57	10.34	161	43.825	394	32.19	88
Feb. 9.7	11.602	388	23.80	190	2.912	326	9.39	60	55.43	54	11.95	197	44.219	377	31.31	28
19.7	11.990	360	25.70	203	3.238	302	8.79	6	55.97	50	13.92	225	44.596	348	31.03	34
29.7	12.350	327	27.73	212	3.540	270	8.73	45	56.47	45	16.17	249	44.944	313	31.37	91
Mar. 10.6	12.677	291	29.85	215	3.810	236	9.18	92	56.92	40	18.66	265	45.257	271	32.28	144
20.6	12.968	253	32.00	215	4.046	197	10.10	133	57.32	34	21.31	276	45.528	226	33.72	188
30.6	13.221	214	34.15	209	4.243	160	11.43	169	57.66	27	24.07	282	45.754	178	35.60	223
Apr. 9.6	13.435	176	36.24	202	4.403	123	13.12	192	57.93	22	26.89	282	45.932	130	37.83	251
19.5	13.611	138	38.26	193	4.526	84	15.04	211	58.15	16	29.71	277	46.062	81	40.34	266
29.5	13.749	98	40.19	179	4.610	48	17.15	218	58.31	10	32.48	264	46.143	35	43.00	271
May 9.5	13.847	60	41.98	162	4.658	15	19.33	220	58.41	3	35.12	249	46.178	9	45.71	268
19.4	13.907	22	43.60	144	4.673	19	21.53	213	58.44	2	37.61	228	46.169	51	48.39	254
29.4	13.929	16	45.04	123	4.654	47	23.66	197	58.42	8	39.89	201	46.118	90	50.93	235
June 8.4	13.913	51	46.27	100	4.607	76	25.63	179	58.34	14	41.90	172	46.028	125	53.28	206
18.4	13.862	86	47.27	73	4.531	101	27.42	152	58.20	19	43.62	138	45.903	156	55.34	172
28.3	13.776	117	48.00	47	4.430	124	28.94	124	58.01	25	45.00	98	45.747	181	57.06	135
July 8.3	13.659	143	48.47	17	4.306	144	30.18	93	57.76	28	45.98	58	45.566	205	58.41	95
18.3	13.516	166	48.64	14	4.162	157	31.11	57	57.48	30	46.56	16	45.361	221	59.36	50
28.3	13.350	181	48.50	42	4.005	168	31.68	22	57.18	33	46.72	29	45.140	233	59.86	5
Aug. 7.2	13.169	188	48.08	72	3.837	173	31.90	15	56.85	33	46.43	73	44.907	236	59.91	40
17.2	12.981	185	47.36	98	3.664	170	31.75	51	56.52	33	45.70	114	44.671	231	59.51	86
27.2	12.796	173	46.38	123	3.494	162	31.24	89	56.19	30	44.56	152	44.440	219	58.65	129
Sept. 6.1	12.623	151	45.15	141	3.332	144	30.35	125	55.89	25	43.04	185	44.221	200	57.36	172
16.1	12.472	115	43.74	155	3.188	119	29.10	161	55.64	20	41.19	212	44.021	170	55.64	212
26.1	12.357	73	42.19	162	3.069	86	27.49	192	55.44	14	39.07	231	43.851	132	53.52	250
Oct. 6.1	12.284	20	40.57	162	2.983	45	25.57	224	55.30	6	36.76	240	43.719	85	51.02	280
16.0	12.264	40	38.95	154	2.938	1	23.33	251	55.24	3	34.36	241	43.634	32	48.22	309
26.0	12.304	103	37.41	139	2.937	52	20.82	274	55.27	12	31.95	231	43.602	27	45.13	330
Nov. 5.0	12.407	168	36.02	116	2.989	106	18.08	291	55.39	23	29.64	209	43.629	90	41.83	343
15.0	12.575	232	34.86	86	3.095	158	15.17	304	55.62	31	27.55	182	43.719	152	38.40	350
24.9	12.807	289	34.00	54	3.253	209	12.13	305	55.93	39	25.73	145	43.871	212	34.90	345
Dec. 4.9	13.096	339	33.46	16	3.462	257	9.08	301	56.32	46	24.28	101	44.083	269	31.45	333
14.9	13.435	377	33.30	22	3.719	293	6.07	285	56.78	52	23.27	54	44.352	317	28.12	308
24.8	13.812	407	33.52	60	4.012	324	3.22	261	57.30	56	22.73	6	44.669	355	25.04	275
34.8	14.219		34.12		4.336		0.61		57.86		22.67		45.024		22.29	
Mean Place	10.026		21.99		1.423		34.32		52.996		21.74		42.735		59.17	
Sec δ, Tan δ	1.341		−0.894		1.156		+0.580		2.030		−1.767		1.408		+0.992	
Dψ α, Dω α	+0.08		−0.05		+0.05		+0.03		+0.09		−0.09		+0.04		+0.05	
Dψ δ, Dω δ	−0.3		−0.6		−0.3		−0.6		−0.3		−0.6		−0.3		−0.8	

Washington Mean Time.	**α Apodis.** Mag. 3.8				**μ Virginis.** Mag. 4.0				**ε Boötis.** Mag. 2.7				**109 Vir** Mag.	
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.	
	h m		° ′		h m		° ′		h m		° ′		h m	
	14 37		−78 41		14 38		− 5 17		14 41		+27 25		14 42	
	s		″		s		″		s		″		s	
Jan. 0.8	18.73		12.48		38.013		44.35		19.162		23.01		0.169	
		131		41		324		188		329		247		317
10.8	20.04		12.07	—	38.337		46.23		19.491		20.54		0.486	
		136		15		333		185		342		212		327
20.8	21.40		12.22		38.670		48.08		19.833		18.42		0.813	
		137		71		331		175		346		170		328
30.8	22.77		12.93		39.001		49.83		20.179		16.72		1.141	
		135		124		323		159		339		122		319
Feb. 9.7	24.12		14.17		39.324		51.42		20.518		15.50		1.460	
		129		173		305		141		323		70		303
19.7	25.41		15.90		39.629		52.83		20.841		14.80		1.763	
		121		215		284		116		300		21		282
29.7	26.62		18.05		39.913		53.99		21.141		14.59	—	2.045	
		112		254		258		91		273		30		256
Mar. 10.6	27.74		20.59		40.171		54.90		21.414		14.89		2.301	
		98		283		230		65		240		77		230
20.6	28.72		23.42		40.401		55.55		21.654		15.66		2.531	
		85		307		200		40		203		118		199
30.6	29.57		26.49		40.601		55.95		21.857		16.84		2.730	
		71		325		170		16		169		154		168
Apr. 9.6	30.28		29.74		40.771		56.11	—	22.026		18.38		2.898	
		56		334		141		4		133		180		140
19.5	30.84		33.08		40.912		56.07		22.159		20.18		3.038	
		39		339		112		22		97		200		110
29.5	31.23		36.47		41.024		55.85		22.256		22.18		3.148	
		22		334		82		35		62		210		81
May 9.5	31.45		39.81		41.106		55.50		22.318		24.28		3.229	
		6		323		56		47		29		214		53
19.4	31.51	—	43.04		41.162		55.03		22.347	—	26.42		3.282	
		11		304		27		55		6		207		25
29.4	31.40		46.08		41.189		54.48		22.341		28.49		3.307	—
		27		280		2		59		36		196		1
June 8.4	31.13		48.88		41.191	—	53.89		22.305		30.45		3.306	
		42		248		26		63		63		179		28
18.4	30.71		51.36		41.165		53.26		22.242		32.24		3.278	
		57		210		49		63		91		155		52
28.3	30.14		53.46		41.116		52.63		22.151		33.79		3.226	
		68		166		74		62		114		130		76
July 8.3	29.46		55.12		41.042		52.01		22.037		35.09		3.150	
		79		121		92		60		134		99		95
18.3	28.67		56.33		40.950		51.41		21.903		36.08		3.055	
		86		67		112		56		150		67		114
28.3	27.81		57.00		40.838		50.85		21.753		36.75		2.941	
		91		14		123		51		163		34		125
Aug. 7.2	26.90		57.14	—	40.715		50.34		21.590		37.09	—	2.816	
		93		41		130		45		168		3		133
17.2	25.97		56.73		40.585		49.89		21.422		37.06		2.683	
		90		96		132		37		169		38		135
27.2	25.07		55.77		40.453		49.52		21.253		36.68		2.548	
		84		144		126		26		163		72		130
Sept. 6.1	24.23		54.33		40.327		49.26		21.090		35.96		2.418	
		74		194		111		15		146		109		115
16.1	23.49		52.39		40.216		49.11		20.944		34.87		2.303	
		61		231		89		0		123		144		95
26.1	22.88		50.08		40.127		49.11		20.821		33.43		2.208	
		44		265		59		17		91		177		65
Oct. 6.1	22.44		47.43		40.068		49.28		20.730		31.66		2.143	
		25		285		22		36		55		207		28
16.0	22.19		44.58		40.046	—	49.64		20.675		29.59		2.115	—
		4		297		22		57		9		235		14
26.0	22.15	—	41.61		40.068		50.21		20.666	—	27.24		2.129	
		18		296		69		81		43		260		61
Nov. 5.0	22.33		38.65		40.137		51.02		20.709		24.64		2.190	
		42		284		119		103		95		278		109
15.0	22.75		35.81		40.256		52.05		20.804		21.86		2.299	
		61		259		168		127		147		291		159
24.9	23.36		33.22		40.424		53.32		20.951		18.95		2.458	
		84		225		213		146		198		298		204
Dec. 4.9	24.20		30.97		40.637		54.78		21.149		15.97		2.662	
		102		182		254		165		243		295		246
14.9	25.22		29.15		40.891		56.43		21.392		13.02		2.908	
		114		133		287		177		283		283		278
24.8	26.36		27.82		41.178		58.20		21.675		10.19		3.186	
		126		79		312		184		313		262		305
34.8	27.62		27.03		41.490		60.04		21.988		7.57		3.491	
Mean Place	21.667		21.95		37.891		37.04		19.114		39.84		0.055	
Sec δ, Tan δ	5.101		−5.001		1.004		−0.093		1.127		+0.519		1.001	
$D_\psi \alpha$, $D_\omega \alpha$	+0.14		−0.26		+0.06		0.00		+0.05		+0.03		+0.06	
$D_\psi \delta$, $D_\omega \delta$	−0.3		−0.6		−0.3		−0.6		−0.3		−0.6		−0.3	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	8 Libræ. Mag. 5.3				α Libræ. Mag. 2.9				Groombridge 2164. Mag. 5.7				β Ursæ Minoris. Mag. 2.2			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 14 46		° ′ −15 38		h m 14 46		° ′ −15 41		h m 14 49		° ′ +59 37		h m 14 50		° ′ +74 29	
	s		″		s		″		s		″		s		″	
Jan. 0.8	2.302		59.21		13.749		40.38		17.790		42.91		54.33		31.21	
10.8	2.636	334	60.76	155	14.082	333	41.92	154	18.246	456	40.35	256	55.08	75	28.81	240
20.8	2.980	344	62.39	163	14.425	343	43.54	162	18.738	492	38.34	201	55.89	81	27.01	180
30.8	3.322	342	64.03	164	14.768	343	45.18	164	19.247	509	36.94	140	56.76	87	25.83	118
Feb. 9.7	3.657	335	65.63	160	15.102	334	46.79	161	19.758	511	36.19	75	57.64	88	25.33	50
19.7	3.976	319	67.15	152	15.422	320	48.31	152	20.252	494	36.12	7	58.50	86	25.52	19
29.7	4.274	298	68.55	140	15.719	297	49.71	140	20.718	466	36.70	58	59.31	81	26.36	84
Mar. 10.6	4.546	272	69.77	122	15.991	272	50.94	123	21.138	420	37.90	120	60.04	73	27.84	148
20.6	4.790	244	70.84	107	16.235	244	52.01	107	21.505	367	39.67	177	60.68	64	29.86	202
30.6	5.005	215	71.72	88	16.451	216	52.89	88	21.810	305	41.92	225	61.19	51	32.34	248
Apr. 9.6	5.190	185	72.42	70	16.637	186	53.59	70	22.047	237	44.54	262	61.58	39	35.17	283
19.5	5.347	157	72.95	53	16.793	156	54.13	54	22.214	167	47.42	288	61.83	25	38.24	307
29.5	5.473	126	73.32	37	16.919	126	54.51	38	22.310	96	50.48	306	61.92	9	41.43	319
May 9.5	5.570	97	73.56	24	17.017	98	54.74	23	22.336	26	53.57	309	61.89	3	44.63	320
19.5	5.638	68	73.68	12	17.084	67	54.85	11	22.293	43	56.59	302	61.72	17	47.71	308
29.4	5.676	38	73.67	1	17.124	40	54.86	1	22.188	105	59.46	287	61.42	30	50.60	289
June 8.4	5.685	9	73.58	9	17.134	10	54.77	9	22.024	164	62.06	260	60.99	43	53.19	259
18.4	5.669	16	73.40	18	17.116	18	54.59	18	21.807	217	64.35	229	60.47	52	55.42	223
28.3	5.623	46	73.16	24	17.072	44	54.33	26	21.543	264	66.26	191	59.86	61	57.22	180
July 8.3	5.554	69	72.82	34	17.001	71	54.01	32	21.239	304	67.73	147	59.18	68	58.55	133
18.3	5.461	93	72.43	39	16.909	92	53.62	39	20.904	335	68.73	100	58.44	74	59.38	83
28.3	5.348	113	71.99	44	16.796	113	53.18	44	20.545	359	69.23	50	57.67	77	59.68	30
Aug. 7.2	5.221	127	71.48	51	16.669	127	52.68	50	20.171	374	69.22	1	56.87	80	59.45	23
17.2	5.085	136	70.95	53	16.532	137	52.15	53	19.792	379	68.70	52	56.07	80	58.69	76
27.2	4.946	139	70.41	54	16.394	138	51.60	55	19.418	374	67.68	102	55.29	78	57.41	128
Sept. 6.2	4.813	133	69.84	57	16.260	134	51.05	55	19.060	358	66.17	151	54.54	75	55.64	177
16.1	4.694	119	69.33	51	16.142	118	50.52	53	18.728	332	64.20	197	53.84	70	53.41	223
26.1	4.598	96	68.87	46	16.044	98	50.05	47	18.436	292	61.79	241	53.22	62	50.76	265
Oct. 6.1	4.533	65	68.50	37	15.979	65	49.68	37	18.193	243	59.01	278	52.69	53	47.73	303
16.0	4.505	28	68.27	23	15.952	27	49.45	23	18.012	181	55.88	313	52.28	41	44.41	332
26.0	4.523	18	68.21	6	15.969	17	49.39	6	17.899	113	52.46	342	51.98	30	40.82	359
Nov. 5.0	4.590	67	68.35	14	16.037	68	49.53	14	17.864	35	48.85	361	51.82	16	37.07	375
15.0	4.708	118	68.72	37	16.156	119	49.89	36	17.912	48	45.12	373	51.80	2	33.24	383
24.9	4.879	171	69.33	61	16.325	169	50.50	61	18.045	133	41.35	377	51.94	14	29.43	381
Dec. 4.9	5.096	217	70.19	86	16.543	218	51.35	85	18.260	215	37.65	370	52.23	29	25.73	370
14.9	5.356	260	71.26	107	16.803	260	52.44	109	18.555	295	34.15	350	52.67	41	22.27	346
24.9	5.650	294	72.55	129	17.098	295	53.71	127	18.920	365	30.92	323	53.24	57	19.15	312
34.8	5.972	322	74.00	145	17.418	320	55.15	144	19.345	425	28.09	283	53.92	68	16.45	270
Mean Place	2.248		54.95		13.694		36.13		18.404		65.92		56.263		55.53	
Sec δ, Tan δ	1.039		−0.280		1.039		−0.281		1.978		+1.707		3.741		+3.605	
$D_\phi \alpha$, $D_\omega \alpha$	+0.07		−0.01		+0.07		−0.01		+0.03		+0.08		0.00		+0.18	
$D_\phi \delta$, $D_\omega \delta$	−0.3		−0.7		−0.3		−0.7		−0.3		−0.7		−0.3		−0.7	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ξ^2 Libræ. Mag. 5.6				Piazzi 221. Mag. 5.8				β Lupi. Mag. 2.8				δ Libræ. Var. 4.8–6.2			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 14 52		° ′ −11 4		h m 14 52		° ′ +14 46		h m 14 53		° ′ −42 47		h m 14 56		° ′ − 8 11	
	s		″		s		″		s		″		s		″	
Jan. 0.8	12.473		22.57		15.305		53.25		1.030		44.52		28.924		17.31	
		326		164		312		232		416		57		319		173
10.8	12.799		24.21		15.617		50.93		1.446		45.09		29.243		19.04	
		335		169		325		207		430		89		331		174
20.8	13.134		25.90		15.942		48.86		1.876		45.98		29.574		20.78	
		336		166		329		178		432		119		333		165
30.8	13.470		27.56		16.271		47.08		2.308		47.17		29.907		22.43	
		329		156		324		144		424		145		326		155
Feb. 9.7	13.799		29.12		16.595		45.64		2.732		48.62		30.233		23.98	
		315		142		309		102		406		166		313		138
19.7	14.114		30.54		16.904		44.62		3.138		50.28		30.546		25.36	
		295		126		290		60		382		181		294		118
29.7	14.409		31.80		17.194		44.02		3.520		52.09		30.840		26.54	
		270		107		265		18		352		192		270		95
Mar. 10.7	14.679		32.87		17.459		43.84	—	3.872		54.01		31.110		27.49	
		244		85		238		22		319		198		244		72
20.6	14.923		33.72		17.697		44.06		4.191		55.99		31.354		28.21	
		215		63		207		61		285		202		217		48
30.6	15.138		34.35		17.904		44.67		4.476		58.01		31.571		28.69	
		187		44		176		91		247		200		189		27
Apr. 9.6	15.325		34.79		18.080		45.58		4.723		60.01		31.760		28.96	
		158		25		145		120		208		196		159		7
19.5	15.483		35.04		18.225		46.78		4.931		61.97		31.919		29.03	—
		129		8		113		138		170		189		132		9
29.5	15.612		35.12	—	18.338		48.16		5.101		63.86		32.051		28.94	
		100		6		82		152		130		179		102		25
May 9.5	15.712		35.06		18.420		49.68		5.231		65.65		32.153		28.69	
		72		17		53		160		92		166		73		35
19.5	15.784		34.89		18.473		51.28		5.323		67.31		32.226		28.34	
		43		27		22		160		50		152		45		45
29.4	15.827		34.62		18.495	—	52.88		5.373		68.83		32.271		27.89	
		14		33		5		156		10		134		17		48
June 8.4	15.841	—	34.29		18.490		54.44		5.383	—	70.17		32.288	—	27.41	
		13		39		34		146		30		112		12		54
18.4	15.828		33.90		18.456		55.90		5.353		71.29		32.276		26.87	
		40		44		60		133		68		90		37		56
28.4	15.788		33.46		18.396		57.23		5.285		72.19		32.239		26.31	
		66		46		84		114		103		63		65		56
July 8.3	15.722		33.00		18.312		58.37		5.182		72.82		32.174		25.75	
		90		49		106		96		135		35		90		55
18.3	15.632		32.51		18.206		59.33		5.047		73.17		32.084		25.20	
		109		50		124		73		163		7		107		54
28.3	15.523		32.01		18.082		60.06		4.884		73.24	—	31.977		24.66	
		125		50		138		50		182		23		124		51
Aug. 7.2	15.398		31.51		17.944		60.56		4.702		73.01		31.853		24.15	
		134		49		147		24		195		52		135		48
17.2	15.264		31.02		17.797		60.80	—	4.507		72.49		31.718		23.67	
		137		48		149		1		198		81		138		41
27.2	15.127		30.54		17.648		60.79		4.309		71.68		31.580		23.26	
		134		43		145		29		190		108		134		34
Sept. 6.2	14.993		30.11		17.503		60.50		4.119		70.60		31.446		22.92	
		122		35		133		57		171		128		124		26
16.1	14.871		29.76		17.370		59.93		3.948		69.32		31.322		22.66	
		98		27		111		85		141		146		102		14
26.1	14.773		29.49		17.259		59.08		3.807		67.86		31.220		22.52	—
		70		14		84		112		100		157		74		1
Oct. 6.1	14.703		29.35	—	17.175		57.96		3.707		66.29		31.146		22.53	
		34		2		48		141		47		161		38		17
16.1	14.669	—	29.37		17.127		56.55		3.660	—	64.68		31.108	—	22.70	
		11		20		6		168		9		158		5		37
26.0	14.680		29.57		17.121	—	54.87		3.669		63.10		31.113		23.07	
		59		41		41		192		74		148		55		57
Nov. 5.0	14.739		29.98		17.162		52.95		3.743		61.62		31.168		23.64	
		109		64		91		216		142		130		101		81
15.0	14.848		30.62		17.253		50.79		3.885		60.32		31.269		24.45	
		160		86		142		232		206		104		153		103
24.9	15.008		31.48		17.395		48.47		4.091		59.28		31.422		25.48	
		208		109		188		244		268		74		201		124
Dec. 4.9	15.216		32.57		17.583		46.03		4.359		58.54		31.623		26.72	
		249		130		233		251		321		42		242		142
14.9	15.465		33.87		17.816		43.52		4.680		58.12		31.865		28.14	
		284		145		269		249		367		4		280		158
24.9	15.749		35.32		18.085		41.03		5.047		58.08	—	32.145		29.72	
		312		159		297		239		399		32		304		166
34.8	16.061		36.91		18.382		38.64		5.446		58.40		32.449		31.38	
Mean Place	12.430		16.88		15.264		66.49		1.265		47.39		28.892		10.73	
Sec δ, Tan δ	1.019		−0.196		1.034		+0.264		1.363		−0.926		1.010		−0.144	
D_ψ α, D_ω α	+0.07		−0.01		+0.06		+0.01		+0.08		−0.04		+0.06		−0.01	
D_ψ δ, D_ω δ	−0.3		−0.7		−0.3		−0.7		−0.3		−0.7		−0.3		−0.7	

Washington Mean Time.	*β* Boötis. Mag. 3.6				*γ* Scorpii. Mag. 3.4				*ψ* Boötis. Mag. 4.7				*c* Boötis. Mag. 5.0			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	14 58		+40 42		14 59		−24 57		15 0		+27 15		15 3		+25 11	
	s		″		s		″		s		″		s		″	
Jan. 0.8	46.702	345	57.28	266	8.952	348	10.78	115	50.683	317	71.99	254	36.609	314	28.43	252
10.8	47.047	367	54.62	223	9.300	359	11.93	132	51.000	334	69.45	221	36.923	330	25.91	222
20.8	47.414	377	52.39	172	9.659	362	13.25	143	51.334	341	67.24	180	37.253	339	23.69	182
30.8	47.791	376	50.67	116	10.021	354	14.68	150	51.675	339	65.44	134	37.592	336	21.87	137
Feb. 9.7	48.167	365	49.51	56	10.375	341	16.18	153	52.014	328	64.10	83	37.928	323	20.50	89
19.7	48.532	343	48.95	5	10.716	322	17.71	150	52.342	307	63.27	31	38.251	307	19.61	38
29.7	48.875	314	49.00	62	11.038	296	19.21	144	52.649	284	62.96	20	38.558	283	19.23	12
Mar. 10.7	49.189	281	49.62	116	11.334	269	20.65	135	52.933	254	63.16	69	38.841	253	19.35	60
20.6	49.470	240	50.78	164	11.603	241	22.00	125	53.187	221	63.85	113	39.094	222	19.95	102
30.6	49.710	199	52.42	203	11.844	211	23.25	112	53.408	187	64.98	150	39.316	190	20.97	141
Apr. 9.6	49.909	155	54.45	234	12.055	181	24.37	100	53.595	152	66.48	179	39.506	154	22.38	169
19.5	50.064	112	56.79	255	12.236	149	25.37	88	53.747	117	68.27	201	39.660	122	24.07	190
29.5	50.176	69	59.34	265	12.385	118	26.25	75	53.864	82	70.28	215	39.782	86	25.97	207
May 9.5	50.245	26	61.99	266	12.503	87	27.00	64	53.946	48	72.43	219	39.868	53	28.04	211
19.5	50.271	14	64.65	258	12.590	55	27.64	52	53.994	14	74.62	216	39.921	21	30.15	209
29.4	50.257	52	67.23	243	12.645	23	28.16	40	54.008	19	76.78	206	39.942	11	32.24	200
June 8.4	50.205	89	69.66	219	12.668	9	28.56	26	53.989	49	78.84	191	39.931	43	34.24	186
18.4	50.116	122	71.85	191	12.659	38	28.82	15	53.940	78	80.75	168	39.888	71	36.10	166
28.4	49.994	153	73.76	157	12.621	69	28.97	2	53.862	106	82.43	145	39.817	96	37.76	142
July 8.3	49.841	176	75.33	119	12.552	95	28.99	12	53.756	128	83.88	114	39.721	123	39.18	113
18.3	49.665	198	76.52	78	12.457	119	28.87	27	53.628	149	85.02	82	39.598	142	40.31	85
28.3	49.467	215	77.30	35	12.338	136	28.60	39	53.479	165	85.84	49	39.456	158	41.16	50
Aug. 7.2	49.252	222	77.65	8	12.202	148	28.21	51	53.314	173	86.33	14	39.298	169	41.66	19
17.2	49.030	224	77.57	52	12.054	152	27.70	62	53.141	177	86.47	23	39.129	172	41.85	18
27.2	48.806	217	77.05	94	11.902	149	27.08	74	52.964	172	86.24	59	38.957	169	41.67	50
Sept. 6.2	48.589	202	76.11	139	11.753	136	26.34	78	52.792	160	85.65	94	38.788	157	41.17	87
16.1	48.387	178	74.72	179	11.617	112	25.56	81	52.632	140	84.71	130	38.631	137	40.30	121
26.1	48.209	145	72.93	217	11.505	81	24.75	80	52.492	111	83.41	165	38.494	108	39.09	155
Oct. 6.1	48.064	103	70.76	253	11.424	40	23.95	72	52.381	74	81.76	196	38.386	72	37.54	186
16.1	47.961	53	68.23	282	11.384	6	23.23	61	52.307	29	79.80	227	38.314	29	35.68	216
26.0	47.908	2	65.41	309	11.390	59	22.62	46	52.278	19	77.53	253	38.285	18	33.52	242
Nov. 5.0	47.910	61	62.32	326	11.449	113	22.16	23	52.297	71	75.00	273	38.303	71	31.10	265
15.0	47.971	120	59.06	337	11.562	168	21.93	2	52.368	125	72.27	289	38.374	125	28.45	280
24.9	48.091	180	55.69	340	11.730	220	21.91	25	52.493	176	69.38	296	38.499	175	25.65	289
Dec. 4.9	48.271	237	52.29	333	11.950	265	22.16	50	52.669	225	66.42	297	38.674	222	22.76	289
14.9	48.508	282	48.96	313	12.215	304	22.66	77	52.894	266	63.45	287	38.896	263	19.87	283
24.9	48.790	324	45.83	287	12.519	331	23.43	100	53.160	299	60.58	268	39.159	296	17.04	265
34.8	49.114		42.96		12.850		24.43		53.459		57.90		39.455		14.39	
Mean Place	46.922		76.74		9.007		8.92		50.764		88.36		36.691		44.23	
Sec δ, Tan δ	1.319		+0.861		1.103		−0.465		1.125		+0.516		1.105		+0.470	
Dψ α, Dω α	+0.05		+0.04		+0.07		−0.02		+0.05		+0.02		+0.05		+0.02	
Dψ δ, Dω δ	−0.3		−0.7		−0.3		−0.7		−0.3		−0.7		−0.3		−0.7	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ζ Lupi. Mag. 3.5				ι Libræ. Mag. 4.7				3 Serpentis. Mag. 5.4				γ Triang. Aust. Mag. 3.1			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	15 6		−51 46		15 7		−19 28		15 11		+ 5 14		15 11		−68 22	
	s		″		s		″		s		″		s		″	
Jan. 0.9	14.027		44.51		25.722		32.34		0.693		51.46		1.38		6.94	
		470		8		330		128		304		207		72		58
10.8	14.497		44.59		26.052		33.62		0.997		49.39		2.10		6.36	
		492		47		345		140		317		195		76		9
20.8	14.989		45.06		26.397		35.02		1.314		47.44		2.86		6.27	—
		497		85		348		146		323		176		78		40
30.8	15.486		45.91		26.745		36.48		1.637		45.68		3.64		6.67	
		492		119		344		147		321		150		77		87
Feb. 9.7	15.978		47.10		27.089		37.95		1.958		44.18		4.41		7.54	
		477		148		331		143		309		119		76		131
19.7	16.455		48.58		27.420		39.38		2.267		42.99		5.17		8.85	
		452		174		313		135		294		85		72		170
29.7	16.907		50.32		27.733		40.73		2.561		42.14		5.89		10.55	
		422		192		292		125		273		52		68		203
Mar. 10.7	17.329		52.24		28.025		41.98		2.834		41.62		6.57		12.58	
		386		210		266		110		248		17		63		232
20.6	17.715		54.34		28.291		43.08		3.082		41.45	—	7.20		14.90	
		347		219		238		96		221		17		56		256
30.6	18.062		56.53		28.529		44.04		3.303		41.62		7.76		17.46	
		304		227		210		82		194		45		49		272
Apr. 9.6	18.366		58.80		28.739		44.86		3.497		42.07		8.25		20.18	
		260		228		182		66		164		70		40		284
19.6	18.626		61.08		28.921		45.52		3.661		42.77		8.65		23.02	
		215		227		152		53		137		91		34		291
29.5	18.841		63.35		29.073		46.05		3.798		43.68		8.99		25.93	
		167		221		121		41		106		105		25		291
May 9.5	19.008		65.56		29.194		46.46		3.904		44.73		9.24		28.84	
		117		211		92		29		77		116		16		285
19.5	19.125		67.67		29.286		46.75		3.981		45.89		9.40		31.69	
		68		199		61		18		49		120		8		273
29.4	19.193		69.66		29.347		46.93		4.030		47.09		9.48	—	34.42	
		18		181		30		9		19		121		2		255
June 8.4	19.211	—	71.47		29.377		47.02		4.049	—	48.30		9.46		36.97	
		31		158		0		1		9		115		10		231
18.4	19.180		73.05		29.377		47.03	—	4.040		49.45		9.36		39.28	
		80		134		32		9		37		110		19		202
28.4	19.100		74.39		29.345		46.94		4.003		50.55		9.17		41.30	
		126		104		60		16		64		100		26		166
July 8.3	18.974		75.43		29.285		46.78		3.939		51.55		8.91		42.96	
		165		72		85		26		89		88		33		126
18.3	18.809		76.15		29.200		46.52		3.850		52.43		8.58		44.22	
		201		38		111		33		110		73		39		83
28.3	18.608		76.53		29.089		46.19		3.740		53.16		8.19		45.05	
		227		3		128		41		127		58		43		37
Aug. 7.3	18.381		76.56	—	28.961		45.78		3.613		53.74		7.76		45.42	—
		243		35		141		48		139		41		45		12
17.2	18.138		76.21		28.820		45.30		3.474		54.15		7.31		45.30	
		250		72		147		54		145		22		47		61
27.2	17.888		75.49		28.673		44.76		3.329		54.37		6.84		44.69	
		243		105		145		58		143		3		45		108
Sept. 6.2	17.645		74.44		28.528		44.18		3.186		54.40	—	6.39		43.61	
		222		136		135		59		135		18		41		152
16.1	17.423		73.08		28.393		43.59		3.051		54.22		5.98		42.09	
		189		163		113		58		116		39		36		190
26.1	17.234		71.45		28.280		43.01		2.935		53.83		5.62		40.19	
		141		182		85		52		91		63		28		223
Oct. 6.1	17.093		69.63		28.195		42.49		2.844		53.20		5.34		37.96	
		84		195		48		44		57		86		19		247
16.1	17.009		67.68		28.147		42.05		2.787		52.34		5.15		35.49	
		16		199		2		29		16		111		7		262
26.0	16.993	—	65.69		28.145	—	41.76		2.771	—	51.23		5.08	—	32.87	
		60		195		48		14		30		134		5		265
Nov. 5.0	17.053		63.74		28.193		41.62	—	2.801		49.89		5.13		30.22	
		137		182		100		7		78		157		17		257
15.0	17.190		61.92		28.293		41.69		2.879		48.32		5.30		27.65	
		214		159		153		30		129		177		30		242
25.0	17.404		60.33		28.446		41.99		3.008		46.55		5.60		25.23	
		287		132		204		52		178		193		41		214
Dec. 4.9	17.691		59.01		28.650		42.51		3.186		44.62		6.01		23.09	
		353		98		249		77		218		205		53		178
14.9	18.044		58.03		28.899		43.28		3.404		42.57		6.54		21.31	
		406		60		286		98		258		211		61		138
24.9	18.450		57.43		29.185		44.26		3.662		40.46		7.15		19.93	
		449		20		316		118		286		210		68		91
34.8	18.899		57.23		29.501		45.44		3.948		38.36		7.83		19.02	
Mean Place	14.526		48.79		25.778		28.82		0.727		61.88		2.806		13.66	
Sec δ, Tan δ	1.616		−1.270		1.061		−0.354		1.004		+0.092		2.714		−2.522	
$D_\psi \alpha$, $D_\omega \alpha$	+0.08		−0.06		+0.07		−0.02		+0.06		0.00		+0.11		−0.11	
$D_\psi \delta$, $D_\omega \delta$	−0.3		−0.7		−0.3		−0.7		−0.3		−0.7		−0.3		−0.7	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	**δ Boötis.** Mag. 3.5				**β Libræ.** Mag. 2.7				**γ Ursæ Minoris.** Mag. 3.1				**μ Boötis *pr.*** Mag. 4.5			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 15 12		° ′ +33 37		h m 15 12		° ′ − 9 4		h m 15 20		° ′ +72 7		h m 15 21		° ′ +37 39	
	s		″		s		″		s		″		s		″	
Jan. 0.9	6.764		21.60		29.027		31.77		48.93		35.68		18.682		58.19	
10.8	7.084	320	18.93	267	29.340	313	33.39	162	49.53	60	32.96	272	19.002	320	55.43	276
20.8	7.425	341	16.63	230	29.667	327	35.03	164	50.22	69	30.77	219	19.348	346	53.06	237
30.8	7.778	353	14.77	186	29.999	332	36.62	159	50.96	74	29.18	159	19.707	359	51.16	190
Feb. 9.7	8.129	351	13.43	134	30.327	328	38.11	149	51.73	77	28.26	92	20.069	362	49.80	136
19.7	8.473	344	12.63	80	30.645	318	39.45	134	52.49	76	28.01	25	20.425	356	49.00	80
29.7	8.800	327	12.40	23	30.945	300	40.59	114	53.23	74	28.46	45	20.766	341	48.80	20
Mar. 10.7	9.102	302	12.73	33	31.225	280	41.52	93	53.92	69	29.55	109	21.083	317	49.17	37
20.6	9.375	273	13.58	85	31.481	256	42.22	70	54.54	62	31.24	169	21.372	289	50.11	94
30.6	9.615	240	14.91	133	31.712	231	42.70	48	55.06	52	33.45	221	21.626	254	51.54	143
Apr. 9.6	9.819	204	16.64	173	31.914	202	42.96	26	55.49	43	36.09	264	21.843	217	53.40	186
19.6	9.985	166	18.70	206	32.089	175	43.03	7	55.80	31	39.04	295	22.021	178	55.59	219
29.5	10.113	128	20.97	227	32.237	148	42.94	9	55.98	18	42.19	315	22.160	139	58.03	244
May 9.5	10.204	91	23.39	242	32.355	118	42.70	24	56.05	7	45.43	324	22.258	98	60.63	260
19.5	10.256	52	25.87	248	32.445	90	42.36	34	56.00	5	48.65	322	22.314	56	63.28	265
29.4	10.271	15	28.30	243	32.504	59	41.94	42	55.84	16	51.72	307	22.331	17	65.88	260
June 8.4	10.250	21	30.63	233	32.534	30	41.47	47	55.56	28	54.59	287	22.309	22	68.38	250
18.4	10.195	55	32.77	214	32.536	2	40.95	52	55.17	39	57.15	256	22.250	59	70.69	231
28.4	10.108	87	34.68	191	32.508	28	40.42	53	54.71	46	59.33	218	22.156	94	72.75	206
July 8.3	9.990	118	36.29	161	32.452	56	39.88	54	54.17	54	61.08	175	22.028	128	74.50	175
18.3	9.847	143	37.58	129	32.370	82	39.35	53	53.56	61	62.36	128	21.872	156	75.91	141
28.3	9.680	167	38.51	93	32.266	104	38.83	52	52.91	65	63.14	78	21.692	180	76.93	102
Aug. 7.3	9.497	183	39.05	54	32.143	123	38.33	50	52.22	69	63.40	26	21.492	200	77.55	62
17.2	9.302	195	39.20	15	32.008	135	37.87	46	51.51	71	63.13	27	21.278	214	77.75	20
27.2	9.103	199	38.95	25	31.865	143	37.45	42	50.80	71	62.33	80	21.059	219	77.52	23
Sept. 6.2	8.906	197	38.29	66	31.724	141	37.10	35	50.11	69	61.03	130	20.842	217	76.86	66
16.1	8.720	186	37.23	106	31.592	132	36.83	27	49.45	66	59.23	180	20.636	206	75.78	108
26.1	8.556	164	35.79	144	31.479	113	36.66	17	48.85	60	56.97	226	20.449	187	74.28	150
Oct. 6.1	8.419	137	33.96	183	31.393	86	36.61	5	48.32	53	54.30	267	20.291	158	72.40	188
16.1	8.321	98	31.79	217	31.341	52	36.72	11	47.87	45	51.25	305	20.171	120	70.14	226
26.0	8.268	53	29.30	249	31.331	10	37.01	29	47.52	35	47.90	335	20.097	74	67.55	259
Nov. 5.0	8.265	3	26.55	275	31.369	38	37.50	49	47.30	22	44.31	359	20.075	22	64.69	286
15.0	8.318	53	23.57	298	31.456	87	38.21	71	47.20	10	40.57	374	20.109	34	61.59	310
25.0	8.426	108	20.44	313	31.595	139	39.13	92	47.23	3	36.77	380	20.204	95	58.35	324
Dec. 4.9	8.590	164	17.25	319	31.781	186	40.26	113	47.41	18	33.00	377	20.355	151	55.04	331
14.9	8.805	215	14.08	317	32.012	231	41.57	131	47.71	30	29.40	360	20.561	206	51.76	328
24.9	9.065	260	11.04	304	32.280	268	43.04	147	48.14	43	26.04	336	20.816	255	48.60	316
34.8	9.363	298	8.20	284	32.576	296	44.60	156	48.67	53	23.06	298	21.112	296	45.67	293
Mean Place	6.987		39.12		29.068		25.32		51.174		58.30		19.029		76.22	
Sec δ, Tan δ	1.201		+0.665		1.013		−0.160		3.258		+3.101		1.263		+0.772	
$D_\psi \alpha$, $D_\omega \alpha$	+0.05		+0.03		+0.06		−0.01		0.00		+0.13		+0.05		+0.03	
$D_\psi \delta$, $D_\omega \delta$	−0.3		−0.7		−0.3		−0.7		−0.3		−0.8		−0.3		−0.8	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	τ^1 Serpentis. Mag. 5.5				ι Draconis. Mag. 3.5				32 Libræ. Mag. 5.9				β Coronæ Borealis. Mag. 3.7			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	15 21		+15 42		15 23		+59 15		15 23		−16 25		15 24		+29 23	
	s		″		s		″		s		″		s		″	
Jan. 0.9	53.418		68.51		2.625		14.29		30.867		32.59		21.697		24.40	
		296		236		412		286		318		130		304		266
10.8	53.714		66.15		3.037		11.43		31.185		33.89		22.001		21.74	
		314		213		457		235		333		139		326		233
20.8	54.028		64.02		3.494		9.08		31.518		35.28		22.327		19.41	
		323		185		487		178		341		141		338		192
30.8	54.351		62.17		3.981		7.30		31.859		36.69		22.665		17.49	
		324		149		500		115		339		139		340		145
Feb. 9.8	54.675		60.68		4.481		6.15		32.198		38.08		23.005		16.04	
		315		109		495		47		328		132		335		92
19.7	54.990		59.59		4.976		5.68	—	32.526		39.40		23.340		15.12	
		300		66		480		21		315		121		320		39
29.7	55.290		58.93		5.456		5.89		32.841		40.61		23.660		14.73	—
		281		22		446		84		295		107		298		15
Mar. 10.7	55.571		58.71	—	5.902		6.73		33.136		41.68		23.958		14.88	
		257		21		403		145		272		92		273		66
20.6	55.828		58.92		6.305		8.18		33.408		42.60		24.231		15.54	
		231		61		350		200		247		75		243		114
30.6	56.059		59.53		6.655		10.18		33.655		43.35		24.474		16.68	
		201		95		289		243		220		59		210		154
Apr. 9.6	56.260		60.48		6.944		12.61		33.875		43.94		24.684		18.22	
		172		125		225		278		193		42		176		186
19.6	56.432		61.73		7.169		15.39		34.068		44.36		24.860		20.08	
		142		147		156		301		165		30		142		212
29.5	56.574		63.20		7.325		18.40		34.233		44.66		25.002		22.20	
		110		165		86		314		136		18		105		227
May 9.5	56.684		64.85		7.411		21.54		34.369		44.84		25.107		24.47	
		80		172		19		315		106		6		69		235
19.5	56.764		66.57		7.430	—	24.69		34.475		44.90	—	25.176		26.82	
		49		176		50		305		75		3		34		235
29.5	56.813		68.33		7.380		27.74		34.550		44.87		25.210		29.17	
		17		173		111		288		44		9		0		227
June 8.4	56.830	—	70.06		7.269		30.62		34.594		44.78		25.210		31.44	
		14		162		171		260		13		16		36		211
18.4	56.816		71.68		7.098		33.22		34.607	—	44.62		25.174		33.55	
		42		151		225		227		18		21		68		191
28.4	56.774		73.19		6.873		35.49		34.589		44.41		25.106		35.46	
		71		134		274		187		49		27		98		165
July 8.3	56.703		74.53		6.599		37.36		34.540		44.14		25.008		37.11	
		97		112		314		143		78		31		126		136
18.3	56.606		75.65		6.285		38.79		34.462		43.83		24.882		38.47	
		120		91		348		96		103		36		150		103
28.3	56.486		76.56		5.937		39.75		34.359		43.47		24.732		39.50	
		139		64		372		46		124		40		170		67
Aug. 7.3	56.347		77.20		5.565		40.21	—	34.235		43.07		24.562		40.17	
		151		40		387		5		139		44		183		31
17.2	56.196		77.60		5.178		40.16		34.096		42.63		24.379		40.48	—
		159		11		391		55		148		47		190		7
27.2	56.037		77.71	—	4.787		39.61		33.948		42.16		24.189		40.41	
		159		18		386		108		148		47		190		44
Sept. 6.2	55.878		77.53		4.401		38.53		33.800		41.69		23.999		39.97	
		151		46		367		155		140		47		181		84
16.2	55.727		77.07		4.034		36.98		33.660		41.22		23.818		39.13	
		135		76		336		203		124		43		163		121
26.1	55.592		76.31		3.698		34.95		33.536		40.79		23.655		37.92	
		109		105		294		246		96		36		137		158
Oct. 6.1	55.483		75.26		3.404		32.49		33.440		40.43		23.518		36.34	
		76		134		239		283		61		28		101		191
16.1	55.407		73.92		3.165		29.66		33.379		40.15		23.417		34.43	
		36		162		175		318		18		14		60		225
26.0	55.371	—	72.30		2.990		26.48		33.361	—	40.01	—	23.357		32.18	
		9		188		100		345		30		4		10		252
Nov. 5.0	55.380		70.42		2.890		23.03		33.391		40.05		23.347	—	29.66	
		59		212		20		363		83		22		42		275
15.0	55.439		68.30		2.870	—	19.40		33.474		40.27		23.389		26.91	
		110		230		65		374		134		43		97		293
25.0	55.549		66.00		2.935		15.66		33.608		40.70		23.486		23.98	
		160		244		149		374		184		65		150		302
Dec. 4.9	55.709		63.56		3.084		11.92		33.792		41.35		23.636		20.96	
		205		251		233		364		230		86		201		304
14.9	55.914		61.05		3.317		8.28		34.022		42.21		23.837		17.92	
		245		252		308		341		271		105		246		297
24.9	56.159		58.53		3.625		4.87		34.293		43.26		24.083		14.95	
		279		243		374		309		301		120		282		279
34.9	56.438		56.10		3.999		1.78		34.594		44.46		24.365		12.16	
Mean Place	53.543		81.54		3.659		35.64		30.975		28.01		21.949		40.60	
Sec δ, Tan δ	1.039		+0.281		1.956		+1.681		1.043		−0.295		1.148		+0.563	
$D_\psi \alpha$, $D_\omega \alpha$	+0.06		+0.01		+0.03		+0.07		+0.07		−0.01		+0.05		+0.02	
$D_\psi \delta$, $D_\omega \delta$	−0.3		−0.8		−0.3		−0.8		−0.3		−0.8		−0.2		−0.8	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ν^1 Boötis. Mag. 5.2				γ Lupi (*mean*). Mag. 3.0				γ Libræ. Mag. 4.0				α Coronæ Borealis. Mag. 2.3			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 15 27		° ′ +41 6		h m 15 29		° ′ −40 53		h m 15 30		° ′ −14 30		h m 15 31		° ′ +26 59	
	s		″		s		″		s		″		s		″	
Jan. 0.9	54.267		49.28		31.886		6.61		49.373		41.34		7.585		32.57	
10.8	54.559	322	46.45	283	32.273	387	6.86	25	49.684	311	42.67	133	7.882	297	29.94	263
20.8	54.940	351	44.02	243	32.682	409	7.40	54	50.012	328	44.07	140	8.202	320	27.60	234
30.8	55.308	368	42.08	194	33.099	417	8.22	82	50.348	336	45.47	140	8.534	332	25.65	195
Feb. 9.8	55.682	374	40.70	138	33.517	418	9.26	104	50.683	335	46.84	137	8.870	336	24.16	149
19.7	56.051	369	39.89	81	33.925	408	10.51	125	51.011	328	48.12	128	9.201	331	23.16	100
29.7	56.406	355	39.70	19	34.317	392	11.90	139	51.325	314	49.25	113	9.518	317	22.69	47
Mar. 10.7	56.739	333	40.12	42	34.689	372	13.41	151	51.619	294	50.24	99	9.816	298	22.73	4
20.7	57.042	303	41.11	99	35.032	343	14.99	158	51.894	275	51.06	82	10.090	274	23.28	55
30.6	57.311	269	42.61	150	35.346	314	16.62	163	52.143	249	51.69	63	10.335	245	24.30	102
Apr. 9.6	57.542	231	44.55	194	35.629	283	18.27	165	52.368	225	52.16	47	10.550	215	25.72	142
19.6	57.731	189	46.84	229	35.878	249	19.91	164	52.566	198	52.45	29	10.733	183	27.48	176
29.5	57.878	147	49.40	256	36.092	214	21.52	161	52.735	169	52.61	16	10.882	149	29.48	200
May 9.5	57.982	104	52.11	271	36.268	176	23.08	156	52.877	142	52.64	3	10.996	114	31.67	219
19.5	58.043	61	54.88	277	36.406	138	24.56	148	52.989	112	52.58	6	11.075	79	33.94	227
29.5	58.060	17	57.62	274	36.503	97	25.95	139	53.070	81	52.43	15	11.120	45	36.22	228
June 8.4	58.036	24	60.24	262	36.558	55	27.22	127	53.120	50	52.21	22	11.130	10	38.43	221
18.4	57.972	64	62.67	243	36.571	13	28.33	111	53.138	18	51.94	27	11.106	24	40.50	207
28.4	57.870	102	64.83	216	36.543	28	29.29	96	53.124	14	51.63	31	11.048	58	42.39	189
July 8.4	57.734	136	66.69	186	36.474	69	30.03	74	53.080	44	51.29	34	10.961	87	44.04	165
18.3	57.566	168	68.18	149	36.367	107	30.56	53	53.007	73	50.93	36	10.845	116	45.42	138
28.3	57.372	194	69.27	109	36.228	139	30.83	27	52.908	99	50.53	40	10.705	140	46.48	106
Aug. 7.3	57.156	216	69.94	67	36.061	167	30.86	3	52.786	122	50.12	41	10.543	162	47.21	73
17.2	56.926	230	70.17	23	35.874	187	30.61	25	52.649	137	49.69	43	10.367	176	47.59	38
27.2	56.689	237	69.95	22	35.677	197	30.11	50	52.501	148	49.25	44	10.182	185	47.61	2
Sept. 6.2	56.452	237	69.29	66	35.478	199	29.35	76	52.352	149	48.82	43	9.997	185	47.26	35
16.2	56.226	226	68.18	111	35.290	188	28.36	99	52.210	142	48.42	40	9.819	178	46.53	73
26.1	56.020	206	66.64	154	35.125	165	27.18	118	52.084	126	48.06	36	9.658	161	45.44	109
Oct. 6.1	55.844	176	64.69	195	34.994	131	25.86	132	51.983	101	47.79	27	9.522	136	44.01	143
16.1	55.705	139	62.37	232	34.908	86	24.44	142	51.917	66	47.61	18	9.419	103	42.22	179
26.1	55.614	91	59.70	267	34.876	32	23.01	143	51.892	25	47.58	3	9.358	61	40.11	211
Nov. 5.0	55.576	38	56.74	296	34.904	28	21.62	139	51.914	22	47.71	13	9.344	14	37.72	239
15.0	55.596	20	53.56	318	34.996	92	20.35	127	51.987	73	48.03	32	9.382	38	35.08	264
25.0	55.677	81	50.22	334	35.153	157	19.26	109	52.113	126	48.56	53	9.473	91	32.27	281
Dec. 4.9	55.821	144	46.81	341	35.374	221	18.40	86	52.288	175	49.30	74	9.619	146	29.34	293
14.9	56.021	200	43.43	338	35.651	277	17.83	57	52.510	222	50.23	93	9.813	194	26.38	296
24.9	56.272	251	40.18	325	35.977	326	17.55	28	52.771	261	51.34	111	10.051	238	23.47	291
34.9	56.569	297	37.17	301	36.342	365	17.58	3	53.064	293	52.58	124	10.328	277	20.72	275
Mean Place	54.726		67.70		32.242		7.75		49.503		36.17		7.852		48.03	
Sec δ, Tan δ	1.327		+0.873		1.323		−0.866		1.033		−0.259		1.122		+0.509	
$D_\psi a$, $D_\omega a$	+0.04		+0.04		+0.08		−0.04		+0.07		−0.01		+0.05		+0.02	
$D_\psi \delta$, $D_\omega \delta$	−0.2		−0.8		−0.2		−0.8		−0.2		−0.8		−0.2		−0.8	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ζ Cor. Bor. *seq.* Mag. 5.1				α Serpentis. Mag. 2.8				β Serpentis. Mag. 3.7				κ Serpentis. Mag. 4.3			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 15 36		° ′ +36 53		h m 15 40		° ′ + 6 40		h m 15 42		° ′ +15 40		h m 15 44		° ′ +18 23	
	s		″		s		″		s		″		s		″	
Jan. 0.9	12.452	308	71.22	281	7.577	286	70.43	208	18.418	283	49.45	237	57.203	281	47.44	245
10.9	12.760	334	68.41	246	7.863	306	68.35	197	18.701	305	47.08	216	57.484	305	44.99	223
20.8	13.094	351	65.95	200	8.169	316	66.38	175	19.006	317	44.92	190	57.789	318	42.76	193
30.8	13.445	357	63.95	149	8.485	318	64.63	151	19.323	321	43.02	154	58.107	322	40.83	156
Feb. 9.8	13.802	354	62.46	91	8.803	314	63.12	118	19.644	316	41.48	113	58.429	318	39.27	113
19.7	14.156	343	61.55	34	9.117	301	61.94	83	19.960	305	40.35	71	58.747	308	38.14	68
29.7	14.499	322	61.21	— 25	9.418	285	61.11	48	20.265	290	39.64	27	59.055	292	37.46	21
Mar. 10.7	14.821	296	61.46	82	9.703	265	60.63	10	20.555	268	39.37	— 17	59.347	273	37.25	— 24
20.7	15.117	265	62.28	133	9.968	242	60.53	— 24	20.823	245	39.54	58	59.620	247	37.49	68
30.6	15.382	231	63.61	177	10.210	216	60.77	55	21.068	218	40.12	94	59.867	220	38.17	105
Apr. 9.6	15.613	195	65.38	213	10.426	191	61.32	83	21.286	191	41.06	125	60.087	193	39.22	137
19.6	15.808	154	67.51	241	10.617	163	62.15	104	21.477	161	42.31	150	60.280	163	40.59	163
29.6	15.962	116	69.92	257	10.780	134	63.19	121	21.638	131	43.81	168	60.443	131	42.22	181
May 9.5	16.078	75	72.49	266	10.914	104	64.40	132	21.769	100	45.49	178	60.574	101	44.03	192
19.5	16.153	33	75.15	265	11.018	74	65.72	136	21.869	67	47.27	183	60.675	67	45.95	196
29.5	16.186	— 4	77.80	257	11.092	44	67.08	138	21.936	35	49.10	180	60.742	34	47.91	193
June 8.4	16.182	43	80.37	239	11.136	11	68.46	133	21.971	4	50.90	173	60.776	2	49.84	185
18.4	16.139	80	82.76	217	11.147	— 19	69.79	126	21.975	— 28	52.63	160	60.778	— 31	51.69	171
28.4	16.059	115	84.93	186	11.128	48	71.05	114	21.947	60	54.23	144	60.747	62	53.40	153
July 8.4	15.944	145	86.79	155	11.080	78	72.19	101	21.887	87	55.67	123	60.685	91	54.93	132
18.3	15.799	173	88.34	116	11.002	102	73.20	86	21.800	114	56.90	102	60.594	118	56.25	106
28.3	15.626	195	89.50	77	10.900	125	74.06	67	21.686	135	57.92	76	60.476	140	57.31	79
Aug. 7.3	15.431	210	90.27	36	10.775	141	74.73	50	21.551	152	58.68	50	60.336	156	58.10	52
17.3	15.221	220	90.63	— 7	10.634	151	75.23	29	21.399	164	59.18	22	60.180	169	58.62	21
27.2	15.001	220	90.56	50	10.483	154	75.52	9	21.235	165	59.40	— 6	60.011	171	58.83	— 10
Sept. 6.2	14.781	214	90.06	93	10.329	150	75.61	— 14	21.070	161	59.34	36	59.840	166	58.73	40
16.2	14.567	195	89.13	134	10.179	136	75.47	36	20.909	147	58.98	65	59.674	154	58.33	73
26.1	14.372	169	87.79	176	10.043	112	75.11	61	20.762	124	58.33	95	59.520	130	57.60	105
Oct. 6.1	14.203	133	86.03	211	9.931	82	74.50	84	20.638	95	57.38	125	59.390	101	56.55	135
16.1	14.070	89	83.92	246	9.849	43	73.66	110	20.543	55	56.13	154	59.289	61	55.20	166
26.1	13.981	38	81.46	278	9.806	1	72.56	133	20.488	10	54.59	180	59.228	16	53.54	192
Nov. 5.0	13.943	— 18	78.68	300	9.805	— 50	71.23	157	20.478	— 39	52.79	205	59.212	— 32	51.62	218
15.0	13.961	75	75.68	318	9.855	99	69.66	177	20.517	89	50.74	225	59.244	84	49.44	237
25.0	14.036	133	72.50	328	9.954	148	67.89	193	20.606	139	48.49	239	59.328	134	47.07	253
Dec. 5.0	14.169	189	69.22	327	10.102	194	65.96	205	20.745	186	46.10	249	59.462	183	44.54	261
14.9	14.358	239	65.95	318	10.296	233	63.91	213	20.931	230	43.61	250	59.645	225	41.93	260
24.9	14.597	282	62.77	298	10.529	267	61.78	211	21.161	263	41.11	244	59.870	261	39.33	253
34.9	14.879		59.79		10.796		59.67		21.424		38.67		60.131		36.80	
Mean Place	12.892		88.51		7.749		80.94		18.645		62.06		57.464		60.59	
Sec δ, Tan δ	1.250		+0.751		1.007		+0.117		1.039		+0.281		1.053		+0.333	
$D_\psi \alpha$, $D_\omega \alpha$	*+0.04*		+0.03		+0.06		0.00		+0.05		+0.01		+0.05		+0.01	
$D_\psi \delta$, $D_\omega \delta$	*−0.2*		−0.8		−0.2		−0.8		−0.2		−0.8		−0.2		−0.8	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	μ Serpentis. Mag. 3.6				12 H. Draconis. Mag. 5.1				ε Serpentis. Mag. 3.8				ζ Ursæ Minoris. Mag. 4.3			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	15 45		− 3 10		15 45		+62 51		15 46		+ 4 43		15 46		+78 2	
	s		″		s		″		s		″		s		″	
Jan. 0.9	13.906		34.30		21.40		11.45		37.443		37.84		57.36		51.20	
10.9	14.194	288	36.02	172	21.81	41	8.45	300	37.725	282	35.83	201	58.11	75	48.33	287
20.8	14.503	309	37.69	167	22.28	47	5.92	253	38.029	304	33.93	190	58.99	88	45.97	236
30.8	14.821	318	39.27	158	22.79	51	3.94	198	38.343	314	32.21	172	59.98	99	44.16	181
Feb. 9.8	15.142	321	40.69	142	23.33	54	2.59	135	38.660	317	30.72	149	61.04	106	42.99	117
19.7	15.458	316	41.89	120	23.87	54	1.90	69	38.974	314	29.54	118	62.12	108	42.50	49
29.7	15.762	304	42.86	97	24.40	53	1.90	0	39.276	302	28.68	86	63.20	108	42.68	18
Mar. 10.7	16.052	290	43.54	68	24.91	51	2.56	66	39.564	288	28.16	52	64.23	103	43.52	84
20.7	16.323	271	43.96	42	25.38	47	3.86	130	39.833	269	28.00	16	65.18	95	44.99	147
30.6	16.571	248	44.09	13	25.79	41	5.72	186	40.079	246	28.17	17	66.01	83	47.01	202
Apr. 9.6	16.796	225	43.97	12	26.14	35	8.06	234	40.301	222	28.64	47	66.69	68	49.48	247
19.6	16.995	199	43.63	34	26.42	28	10.79	273	40.498	197	29.38	74	67.22	53	52.31	283
29.6	17.167	172	43.11	52	26.62	20	13.81	302	40.667	169	30.33	95	67.57	35	55.40	309
May 9.5	17.313	146	42.43	68	26.75	13	16.99	318	40.809	142	31.45	112	67.73	16	58.63	323
19.5	17.429	116	41.65	78	26.80	5	20.22	323	40.920	111	32.68	123	67.72	1	61.88	325
29.5	17.516	87	40.81	84	26.78	2	23.40	318	41.001	81	33.97	129	67.51	21	65.04	316
June 8.4	17.571	55	39.94	87	26.68	10	26.44	304	41.053	52	35.26	129	67.14	37	68.05	301
18.4	17.595	24	39.07	87	26.51	17	29.25	281	41.072	19	36.53	127	66.62	52	70.79	274
28.4	17.588	7	38.22	85	26.27	24	31.74	249	41.059	13	37.73	120	65.94	68	73.19	240
July 8.4	17.549	39	37.42	80	25.97	30	33.85	211	41.016	43	38.83	110	65.13	81	75.19	200
18.3	17.480	69	36.69	73	25.61	36	35.54	169	40.944	72	39.82	99	64.22	91	76.75	156
28.3	17.386	94	36.03	66	25.22	39	36.77	123	40.846	98	40.66	84	63.23	99	77.82	107
Aug. 7.3	17.268	118	35.46	57	24.80	42	37.50	73	40.723	123	41.33	67	62.17	106	78.39	57
17.3	17.133	135	34.98	48	24.35	45	37.72	22	40.585	138	41.85	52	61.06	111	78.43	4
27.2	16.986	147	34.61	37	23.89	46	37.42	30	40.435	150	42.18	33	59.95	111	77.95	48
Sept. 6.2	16.835	151	34.37	24	23.43	46	36.60	82	40.280	155	42.31	13	58.84	111	76.96	99
16.2	16.688	147	34.25	12	22.98	45	35.27	133	40.129	151	42.24	7	57.77	107	75.48	148
26.1	16.554	134	34.28	3	22.56	42	33.46	181	39.991	138	41.95	29	56.76	101	73.52	196
Oct. 6.1	16.443	111	34.48	20	22.19	37	31.19	227	39.876	115	41.45	50	55.84	92	71.12	240
16.1	16.363	80	34.85	37	21.87	32	28.51	268	39.790	86	40.71	74	55.03	81	68.34	278
26.1	16.321	42	35.41	56	21.62	25	25.46	305	39.742	48	39.75	96	54.37	66	65.20	314
Nov. 5.0	16.324	3	36.19	78	21.45	17	22.11	335	39.737	5	38.53	122	53.86	51	61.80	340
15.0	16.375	51	37.16	97	21.36	9	18.53	358	39.781	44	37.10	143	53.53	33	58.19	361
25.0	16.477	102	38.35	119	21.37	1	14.81	372	39.877	96	35.46	164	53.40	13	54.48	371
Dec. 5.0	16.627	150	39.71	136	21.47	10	11.05	376	40.020	143	33.65	181	53.46	6	50.76	372
14.9	16.824	197	41.23	152	21.66	19	7.35	370	40.208	188	31.71	194	53.74	28	47.14	362
24.9	17.060	236	42.87	164	21.95	29	3.84	351	40.438	230	29.70	201	54.20	46	43.73	341
34.9	17.329	269	44.56	169	22.32	37	0.62	322	40.702	264	27.68	202	54.84	64	40.63	310
Mean Place	14.077		26.23		22.961		31.84		37.636		47.80		61.892		72.36	
Sec δ, Tan δ	1.002		−0.055		2.192		+1.951		1.003		+0.083		4.830		+4.725	
Dψ α, Dω α	+0.06		0.00		+0.02		+0.07		+0.06		0.00		−0.04		+0.17	
Dψ δ, Dω δ	−0.2		−0.8		−0.2		−0.8		−0.2		−0.8		−0.2		−0.8	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Triang. Aust. Mag. 3.0				λ Libræ. Mag. 5.1				γ Serpentis. Mag. 3.9				π Scorpii. Mag. 3.0			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 15 47		° ′ −63 10		h m 15 48		° ′ −19 55		h m 15 52		° ′ +15 55		h m 15 53		° ′ −25 52	
	s		″		s		″		s		″		s		″	
Jan. 0.9	42.54	57	17.41	86	27.059	310	5.17	101	34.061	275	53.71	242	45.752	319	26.40	70
10.9	43.11	61	16.55	44	27.369	330	6.18	112	34.336	300	51.29	221	46.071	340	27.10	85
20.8	43.72	64	16.11	$\underline{2}$	27.699	341	7.30	118	34.636	313	49.08	194	46.411	354	27.95	97
30.8	44.36	65	16.09	41	28.040	342	8.48	118	34.949	319	47.14	160	46.765	357	28.92	105
Feb. 9.8	45.01	66	16.50	81	28.382	339	9.66	115	35.268	317	45.54	120	47.122	352	29.97	108
19.7	45.67	63	17.31	117	28.721	327	10.81	111	35.585	307	44.34	77	47.474	343	31.05	109
29.7	46.30	60	18.48	149	29.048	312	11.92	98	35.892	294	43.57	$\underline{32}$	47.817	328	32.14	106
Mar. 10.7	46.90	57	19.97	179	29.360	292	12.90	89	36.186	275	43.25	12	48.145	308	33.20	100
20.7	47.47	53	21.76	203	29.652	270	13.79	75	36.461	251	43.37	54	48.453	286	34.20	92
30.6	48.00	47	23.79	222	29.922	246	14.54	61	36.712	227	43.91	90	48.739	262	35.12	85
Apr. 9.6	48.47	42	26.01	236	30.168	220	15.15	51	36.939	200	44.81	123	49.001	236	35.97	77
19.6	48.89	36	28.37	248	30.388	193	15.66	38	37.139	170	46.04	148	49.237	207	36.74	68
29.6	49.25	29	30.85	253	30.581	165	16.04	29	37.309	141	47.52	167	49.444	178	37.42	61
May 9.5	49.54	23	33.38	254	30.746	133	16.33	19	37.450	109	49.19	178	49.622	146	38.03	53
19.5	49.77	16	35.92	249	30.879	103	16.52	14	37.559	77	50.97	184	49.768	112	38.56	47
29.5	49.93	8	38.41	239	30.982	70	16.66	6	37.636	46	52.81	183	49.880	77	39.03	40
June 8.4	50.01	0	40.80	224	31.052	35	16.72	0	37.682	$\underline{12}$	54.64	175	49.957	42	39.43	32
18.4	50.01	7	43.04	201	31.087	$\underline{1}$	16.72	5	37.694	21	56.39	162	49.999	$\underline{5}$	39.75	24
28.4	49.94	14	45.05	175	31.088	33	16.67	9	37.673	52	58.01	148	50.004	30	39.99	17
July 8.4	49.80	21	46.80	144	31.055	65	16.58	17	37.621	83	59.49	127	49.974	66	40.16	$\underline{8}$
18.3	49.59	26	48.24	106	30.990	95	16.41	22	37.538	110	60.76	104	49.908	97	40.24	3
28.3	49.33	32	49.30	67	30.895	121	16.19	29	37.428	133	61.80	79	49.811	126	40.21	15
Aug. 7.3	49.01	35	49.97	$\underline{23}$	30.774	140	15.90	35	37.295	151	62.59	53	49.685	145	40.06	26
17.3	48.66	37	50.20	20	30.634	155	15.55	39	37.144	163	63.12	$\underline{24}$	49.540	162	39.80	37
27.2	48.29	38	50.00	65	30.479	158	15.16	47	36.981	170	63.36	4	49.378	167	39.43	48
Sept. 6.2	47.91	36	49.35	108	30.321	154	14.69	47	36.811	164	63.32	35	49.211	162	38.95	57
16.2	47.55	33	48.27	147	30.167	140	14.22	49	36.647	153	62.97	65	49.049	150	38.38	64
26.1	47.22	27	46.80	182	30.027	115	13.73	47	36.494	132	62.32	94	48.899	124	37.74	67
Oct. 6.1	46.95	21	44.98	210	29.912	83	13.26	42	36.362	102	61.38	124	48.775	90	37.07	68
16.1	46.74	12	42.88	228	29.829	$\underline{41}$	12.84	33	36.260	64	60.14	155	48.685	$\underline{49}$	36.39	63
26.1	46.62	$\underline{3}$	40.60	240	29.788	7	12.51	20	36.196	$\underline{21}$	58.59	181	48.636	3	35.76	55
Nov. 5.0	46.59	8	38.20	240	29.795	58	12.31	$\underline{5}$	36.175	28	56.78	205	48.639	55	35.21	42
15.0	46.67	18	35.80	232	29.853	112	12.26	14	36.203	79	54.73	226	48.694	112	34.79	25
25.0	46.85	28	33.48	212	29.965	164	12.40	33	36.282	129	52.47	242	48.806	166	34.54	$\underline{6}$
Dec. 5.0	47.13	38	31.36	187	30.129	213	12.73	54	36.411	177	50.05	251	48.972	217	34.48	15
14.9	47.51	47	29.49	153	30.342	257	13.27	73	36.588	220	47.54	254	49.189	262	34.63	36
24.9	47.98	53	27.96	114	30.599	289	14.00	90	36.808	256	45.00	247	49.451	298	34.99	55
34.9	48.51		26.82		30.888		14.90		37.064		42.53		49.749		35.54	
Mean Place	43.747		21.58		27.273		1.09		34.337		66.11		46.018		23.56	
Sec δ, Tan δ	2.216		−1.978		1.064		−0.362		1.040		+0.285		1.111		−0.485	
$D_\psi \alpha$, $D_\omega \alpha$	+0.10		−0.07		+0.07		−0.01		+0.05		+0.01		+0.07		−0.02	
$D_\psi \delta$, $D_\omega \delta$	−0.2		−0.8		−0.2		−0.8		−0.2		−0.8		−0.2		−0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ε Coronæ Borealis. Mag. 4.2				δ Scorpii. Mag. 2.5				θ Draconis. Mag. 4.1				β Scorpii. Mag. 2.9			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	15 54		+27 6		15 55		−22 23		16 0		+58 46		16 0		−19 34	
	s		″		s		″		s		″		s		″	
Jan. 0.9	6.128		58.76		21.538		4.42		17.422		62.41		32.702		39.33	
10.9	6.406	278	56.08	268	21.849	311	5.27	85	17.776	354	59.31	310	33.004	302	40.27	94
20.8	6.713	307	53.65	243	22.181	332	6.24	97	18.186	410	56.63	268	33.327	323	41.31	104
30.8	7.035	322	51.61	204	22.524	343	7.29	105	18.636	450	54.48	215	33.663	336	42.41	110
Feb. 9.8	7.365	330	50.00	161	22.872	348	8.39	110	19.112	476	52.93	155	34.004	341	43.52	111
19.8	7.696	331	48.87	113	23.216	344	9.49	110	19.598	486	52.03	90	34.342	338	44.60	108
29.7	8.018	322	48.27	60	23.551	335	10.55	106	20.079	481	51.81	22 —	34.671	329	45.61	101
Mar. 10.7	8.323	305	48.21	6 —	23.871	320	11.54	99	20.542	463	52.27	46	34.987	316	46.53	92
20.7	8.610	287	48.66	45	24.172	301	12.44	90	20.973	431	53.35	108	35.285	298	47.33	80
30.6	8.871	261	49.60	94	24.452	280	13.24	80	21.362	389	55.03	168	35.563	278	47.99	66
Apr. 9.6	9.105	234	50.97	137	24.708	256	13.92	68	21.700	338	57.22	219	35.817	254	48.53	54
19.6	9.308	203	52.70	173	24.939	231	14.51	59	21.979	279	59.83	261	36.048	231	48.95	42
29.6	9.479	171	54.72	202	25.142	203	15.00	49	22.196	217	62.75	292	36.252	204	49.26	31
May 9.5	9.617	138	56.93	221	25.316	174	15.40	40	22.347	151	65.89	314	36.428	176	49.47	21
19.5	9.720	103	59.26	233	25.461	145	15.72	32	22.430	83	69.11	322	36.575	147	49.61	14
29.5	9.787	67	61.63	237	25.572	111	15.97	25	22.446	16 —	72.33	322	36.689	114	49.69	8
June 8.5	9.818	31 —	63.95	232	25.649	77	16.17	20	22.394	52	75.45	312	36.769	80	49.71	2 —
18.4	9.813	5	66.17	222	25.692	43	16.30	13	22.279	115	78.36	201	36.816	47	49.68	3
28.4	9.773	40	68.21	204	25.698	6 —	16.37	7	22.102	177	81.00	264	36.826	10 —	49.61	7
July 8.4	9.699	74	70.03	182	25.669	29	16.38	1 —	21.870	232	83.30	230	36.801	25	49.49	12
18.3	9.593	106	71.58	155	25.606	63	16.32	6	21.590	280	85.20	190	36.743	58	49.33	16
28.3	9.460	133	72.82	124	25.513	93	16.19	13	21.265	325	86.66	146	36.654	89	49.12	21
Aug. 7.3	9.301	159	73.75	93	25.392	121	15.97	22	20.905	360	87.64	98	36.537	117	48.85	27
17.3	9.124	177	74.32	57	25.250	142	15.67	30	20.520	385	88.13	49 —	36.399	138	48.54	31
27.2	8.936	188	74.52	20 —	25.094	156	15.30	37	20.119	401	88.09	4	36.246	153	48.18	36
Sept. 6.2	8.742	194	74.34	18	24.931	163	14.86	44	19.715	404	87.55	54	36.086	160	47.78	40
16.2	8.552	190	73.79	55	24.772	159	14.36	50	19.320	395	86.50	105	35.928	158	47.34	44
26.2	8.375	177	72.88	91	24.626	146	13.82	54	18.945	375	84.96	154	35.782	146	46.89	45
Oct. 6.1	8.220	155	71.59	129	24.504	122	13.27	55	18.604	341	82.95	201	35.659	123	46.46	43
16.1	8.097	123	69.94	165	24.415	89	12.75	52	18.309	295	80.51	244	35.566	93	46.08	38
26.1	8.013	84	67.96	198	24.366	49 —	12.30	45	18.073	236	77.69	282	35.515	51	45.78	30
Nov. 5.0	7.973	40 —	65.68	228	24.367	1	11.95	35	17.905	168	74.50	319	35.509	6 —	45.59	19
15.0	7.985	12	63.13	255	24.420	53	11.74	21	17.813	92	71.06	344	35.556	47	45.53	6 —
25.0	8.050	65	60.38	275	24.528	108	11.70	4 —	17.803	10 —	67.45	361	35.656	100	45.65	12
Dec. 5.0	8.169	119	57.50	288	24.688	160	11.86	16	17.879	76	63.75	370	35.807	151	45.97	32
14.9	8.338	169	54.55	295	24.897	209	12.21	35	18.040	161	60.07	368	36.009	202	46.46	49
24.9	8.555	217	51.62	293	25.151	254	12.75	54	18.280	240	56.53	354	36.253	244	47.14	68
34.9	8.811	256	48.82	280	25.440	289	13.49	74	18.593	313	53.23	330	36.532	279	47.98	84
Mean Place	6.526		73.44		21.789		0.78		18.856		81.45		32.956		34.99	
Sec δ, Tan δ	1.123		+0.512		1.081		−0.412		1.929		+1.650		1.061		−0.356	
$D_\psi\,\alpha$, $D_\omega\,\alpha$	+0.05		+0.02		+0.07		−0.01		+0.02		+0.06		+0.07		−0.01	
$D_\psi\,\delta$, $D_\omega\,\delta$	−0.2		−0.9		−0.2		−0.9		−0.2		−0.9		−0.2		−0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	**κ Herculis.** Mag. 5.3				**Groombridge 2320.** Mag. 5.4				**φ Herculis.** Mag. 4.3				**δ¹ Apodis.** Mag. 4.8			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 16 4		° ′ +17 15		h m 16 6		° ′ +68 1		h m 16 6		° ′ +45 8		h m 16 7		° ′ −78 29	
	s		″		s		″		s		″		s		″	
Jan. 0.9	16.589		58.80		2.90		33.16		6.525		59.57		40.97		6.39	
		267		243		43		312		294		305		111		169
10.9	16.856		56.37		3.33		30.04		6.819		56.52		42.08		4.70	
		293		223		51		268		332		269		123		123
20.8	17.149		54.14		3.84		27.36		7.151		53.83		43.31		3.47	
		308		195		57		214		362		223		131		71
30.8	17.457		52.19		4.41		25.22		7.513		51.60		44.62		2.76	
		316		160		61		152		378		169		136		22
Feb. 9.8	17.773		50.59		5.02		23.70		7.891		49.91		45.98		2.54	—
		316		119		64		87		383		109		139		25
19.8	18.089		49.40		5.66		22.83		8.274		48.82		47.37		2.79	
		310		75		64		18		379		45		137		75
29.7	18.399		48.65		6.30		22.65	—	8.653		48.37	—	48.74		3.54	
		298		29		61		49		366		17		133		117
Mar. 10.7	18.697		48.36	—	6.91		23.14		9.019		48.54		50.07		4.71	
		279		17		57		116		342		78		127		159
20.7	18.976		48.53		7.48		24.30		9.361		49.32		51.34		6.30	
		260		59		52		173		313		136		118		196
30.6	19.236		49.12		8.00		26.03		9.674		50.68		52.52		8.26	
		234		99		45		226		279		185		108		228
Apr. 9.6	19.470		50.11		8.45		28.29		9.953		52.53		53.60		10.54	
		208		131		37		268		239		229		96		253
19.6	19.678		51.42		8.82		30.97		10.192		54.82		54.56		13.07	
		180		159		27		298		196		260		82		276
29.6	19.858		53.01		9.09		33.95		10.388		57.42		55.38		15.83	
		153		179		19		321		151		283		67		291
May 9.5	20.011		54.80		9.28		37.16		10.539		60.25		56.05		18.74	
		119		192		8		328		104		296		51		301
19.5	20.130		56.72		9.36	—	40.44		10.643		63.21		56.56		21.75	
		88		197		1		329		56		299		34		301
29.5	20.218		58.69		9.35		43.73		10.699		66.20		56.90		24.76	
		54		197		11		318		8		293		16		297
June 8.5	20.272		60.66		9.24		46.91		10.707	—	69.13		57.06	—	27.73	
		19		189		20		295		38		278		1		284
18.4	20.291	—	62.55		9.04		49.86		10.669		71.91		57.05		30.57	
		16		177		28		269		84		254		20		266
28.4	20.275		64.32		8.76		52.55		10.585		74.45		56.85		33.23	
		47		161		36		233		126		226		36		239
July 8.4	20.228		65.93		8.40		54.88		10.459		76.71		56.49		35.62	
		78		140		44		192		167		192		52		206
18.3	20.150		67.33		7.96		56.80		10.292		78.63		55.97		37.68	
		110		117		48		147		201		151		66		166
28.3	20.040		68.50		7.48		58.27		10.091		80.14		55.31		39.34	
		132		91		54		98		230		110		78		121
Aug. 7.3	19.908		69.41		6.94		59.25		9.861		81.24		54.53		40.55	
		154		62		57		47		254		64		86		73
17.3	19.754		70.03		6.37		59.72	—	9.607		81.88		53.67		41.28	
		168		35		58		5		268		18		92		18
27.2	19.586		70.38		5.79		59.67		9.339		82.06	—	52.75		41.46	—
		173		2		60		58		275		30		94		37
Sept. 6.2	19.413		70.40	—	5.19		59.09		9.064		81.76		51.81		41.09	
		173		27		58		110		271		77		92		88
16.2	19.240		70.13		4.61		57.99		8.793		80.99		50.89		40.21	
		162		58		55		158		257		123		85		140
26.2	19.078		69.55		4.06		56.41		8.536		79.76		50.04		38.81	
		143		91		51		208		233		169		74		188
Oct. 6.1	18.935		68.64		3.55		54.33		8.303		78.07		49.30		36.93	
		114		120		45		250		197		211		61		230
16.1	18.821		67.44		3.10		51.83		8.106		75.96		48.69		34.63	
		76		151		38		290		153		251		43		260
26.1	18.745		65.93		2.72		48.93		7.953		73.45		48.26		32.03	
		34		178		28		324		101		283		24		284
Nov. 5.0	18.711	—	64.15		2.44		45.69		7.852		70.62		48.02		29.19	
		15		206		19		350		41		312		1		295
15.0	18.726		62.09		2.25		42.19		7.811	—	67.50		48.01	—	26.24	
		64		225		7		365		22		333		21		298
25.0	18.790		59.84		2.18	—	38.54		7.833		64.17		48.22		23.26	
		115		242		4		375		88		346		43		285
Dec. 5.0	18.905		57.42		2.22		34.79		7.921		60.71		48.65		20.41	
		165		252		15		371		150		348		65		264
14.9	19.070		54.90		2.37		31.08		8.071		57.23		49.30		17.77	
		207		254		27		357		210		341		84		237
24.9	19.277		52.36		2.64		27.51		8.281		53.82		50.14		15.40	
		247		248		37		332		264		321		101		196
34.9	19.524		49.88		3.01		24.19		8.545		50.61		51.15		13.44	
Mean Place	16.932		71.16		5.318		52.50		7.374		76.64		44.863		10.94	
Sec δ, Tan δ	1.047		+0.311		2.672		+2.478		1.418		+1.005		5.011		−4.910	
$D_\psi\,\alpha$, $D_\omega\,\alpha$	+0.05		+0.01		0.00		+0.08		+0.04		+0.03		+0.18		−0.16	
$D_\psi\,\delta$, $D_\omega\,\delta$	−0.2		−0.9		−0.2		−0.9		−0.2		−0.9		−0.2		−0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	δ Ophiuchi. Mag. 3.0				σ Cor. Bor. *seq.* Mag. 5.8				19 Ursæ Minoris. Mag. 5.5				γ^2 Normæ. Mag. 4.1			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 16 9		° ′ − 3 28		h m 16 11		° ′ +34 3		h m 16 13		° ′ +76 4		h m 16 13		° ′ −49 57	
	s		″		s		″		s		″		s		″	
Jan. 0.9	56.253		51.71		31.335		60.45		7.75		62.97		32.018		1.22	
		272		163		270		288		57		310		402		61
10.9	56.525		53.34		31.605		57.57		8.32		59.87		32.420		0.61	
		295		159		302		259		71		265		438		29
20.8	56.820		54.93		31.907		54.98		9.03		57.22		32.858		0.32	—
		311		151		325		219		81		212		461		1
30.8	57.131		56.44		32.232		52.79		9.84		55.10		33.319		0.33	
		316		135		339		174		89		152		473		33
Feb. 9.8	57.447		57.79		32.571		51.05		10.73		53.58		33.792		0.66	
		316		113		342		120		94		86		475		60
19.8	57.763		58.92		32.913		49.85		11.67		52.72		34.267		1.26	
		308		91		338		61		94		19		468		85
29.7	58.071		59.83		33.251		49.24		12.61		52.53	—	34.735		2.11	
		298		63		326		2		92		50		453		106
Mar. 10.7	58.369		60.46		33.577		49.22	—	13.53		53.03		35.188		3.17	
		282		36		307		50		87		113		432		127
20.7	58.651		60.82		33.884		49.72		14.40		54.16		35.620		4.44	
		263		9		284		106		78		173		406		142
30.7	58.914		60.91	—	34.168		50.78		15.18		55.89		36.026		5.86	
		243		17		256		153		68		224		377		155
Apr. 9.6	59.157		60.74		34.424		52.31		15.86		58.13		36.403		7.41	
		219		38		225		195		55		267		342		166
19.6	59.376		60.36		34.649		54.26		16.41		60.80		36.745		9.07	
		194		58		191		223		40		299		306		172
29.6	59.570		59.78		34.840		56.49		16.81		63.79		37.051		10.79	
		169		73		155		249		25		319		262		178
May 9.5	59.739		59.05		34.995		58.98		17.06		66.98		37.313		12.57	
		141		83		116		263		10		328		217		178
19.5	59.880		58.22		35.111		61.61		17.16	—	70.26		37.530		14.35	
		109		89		78		268		6		328		169		178
29.5	59.989		57.33		35.189		64.29		17.10		73.54		37.699		16.13	
		77		93		36		264		22		317		117		172
June 8.5	60.066		56.40		35.225	—	66.93		16.88		76.71		37.816		17.85	
		46		92		1		255		35		297		64		162
18.4	60.112		55.48		35.224		69.48		16.53		79.68		37.880		19.47	
		11		89		44		234		49		268		9		150
28.4	60.123	—	54.59		35.180		71.82		16.04		82.36		37.889	—	20.97	
		22		84		80		211		61		234		44		132
July 8.4	60.101		53.75		35.100		73.93		15.43		84.70		37.845		22.29	
		54		77		116		180		73		193		97		111
18.4	60.047		52.98		34 984		75.73		14.70		86.63		37.748		23.40	
		84		67		150		148		81		149		143		86
28.3	59.963		52.31		34.834		77.21		13.89		88.12		37.605		24.26	
		111		60		174		114		88		99		185		57
Aug. 7.3	59.852		51.71		34.660		78.35		13.01		89.11		37.420		24.83	
		132		49		198		73		94		47		219		25
17.3	59.720		51.22		34.462		79.08		12.07		89.58	—	37.201		25.08	—
		147		39		215		30		96		4		241		6
27.2	59.573		50.83		34.247		79.38	—	11.11		89.54		36.960		25.02	
		155		25		221		10		97		55		253		40
Sept. 6.2	59.418		50.58		34.026		79.28		10.14		88.99		36.707		24.62	
		156		14		217		54		96		107		250		74
16.2	59.262		50.44		33.809		78.74		9.18		87.92		36.457		23.88	
		146		0		208		93		91		156		235		103
26.2	59.116		50.44		33.601		77.81		8.27		86.36		36.222		22.85	
		126		16		190		137		86		203		203		131
Oct. 6.1	58.990		50.60		33.411		76.44		7.41		84.33		36.019		21.54	
		99		32		158		175		76		247		161		153
16.1	58.891		50.92		33.253		74.69		6.65		81.86		35.858		20.01	
		62		51		118		213		65		285		103		169
26.1	58.829		51.43		33.135		72.56		6.00		79.01		35.755		18.32	
		20		71		74		246		53		318		37		177
Nov. 5.1	58.809	—	52.14		33.061		70.10		5.47		75.83		35.718	—	16.55	
		28		89		20		274		37		345		35		178
15.0	58.837		53.03		33.041		67.36		5.10		72.38		35.753		14.77	
		77		110		37		296		20		362		110		172
25.0	58.914		54.13		33.078		64.40		4.90		68.76		35.863		13.05	
		127		127		90		312		4		369		185		157
Dec. 5.0	59.041		55.40		33.168		61.28		4.86	—	65.07		36.048		11.48	
		175		142		147		318		13		368		254		138
14.9	59.216		56.82		33.315		58.10		4.99		61.39		36.302		10.10	
		216		153		198		314		32		353		318		111
24.9	59.432		58.35		33.513		54.96		5.31		57.86		36.620		8.99	
		251		159		245		301		47		327		372		82
34.9	59.683		59.94		33.758		51.95		5.78		54.59		36.992		8.17	
Mean Place	56.514		43.81		31.942		75.60		12.164		82.09		32.721		2.23	
Sec δ, Tan δ	1.002		−0.061		1.207		+0.676		4.158		+4.037		1.554		−1.190	
$D_\psi \alpha$, $D_\omega \alpha$	+0.06		0.00		+0.05		+0.02		−0.03		+0.12		+0.09		−0.04	
$D_\psi \delta$, $D_\omega \delta$	−0.2		−0.9		−0.2		−0.9		−0.2		−0.9		−0.2		−0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ε Ophiuchi. Mag. 3.3				σ Scorpii. Mag. 3.1				τ Herculis. Mag. 3.9				γ Herculis. Mag. 3.8			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	16 13		− 4 29		16 16		−25 23		16 17		+46 30		16 18		+19 20	
	s		″		s		″		s		″		s		″	
Jan. 0.9	52.226	270	26.58	157	4.447	304	35.42	55	11.977	285	29.54	312	12.407	257	46.13	249
10.9	52.496	294	28.15	154	4.751	327	35.97	71	12.262	327	26.42	277	12.664	284	43.64	230
20.8	52.790	310	29.69	145	5.078	342	36.68	80	12.589	359	23.65	232	12.948	304	41.34	201
30.8	53.100	317	31.14	132	5.420	352	37.48	87	12.948	379	21.33	178	13.252	314	39.33	165
Feb. 9.8	53.417	316	32.46	111	5.772	351	38.35	90	13.327	388	19.55	118	13.566	317	37.68	123
19.8	53.733	311	33.57	90	6.123	345	39.25	90	13.715	386	18.37	55	13.883	312	36.45	78
29.7	54.044	298	34.47	63	6.468	334	40.15	87	14.101	376	17.82	— 10	14.195	302	35.67	30
Mar. 10.7	54.342	285	35.10	37	6.802	319	41.02	82	14.477	354	17.92	72	14.497	288	35.37	— 18
20.7	54.627	266	35.47	10	7.121	299	41.84	75	14.831	328	18.64	130	14.785	267	35.55	63
30.7	54.893	246	35.57	— 15	7.420	278	42.59	68	15.159	294	19.94	183	15.052	246	36.18	105
Apr. 9.6	55.139	224	35.42	35	7.698	255	43.27	59	15.453	254	21.77	226	15.298	220	37.23	138
19.6	55.363	199	35.07	54	7.953	227	43.86	54	15.707	212	24.03	262	15.518	194	38.61	169
29.6	55.562	173	34.53	69	8.180	199	44.40	47	15.919	166	26.65	286	15.712	163	40.30	190
May 9.5	55.735	145	33.84	79	8.379	168	44.87	43	16.085	118	29.51	300	15.875	131	42.20	204
19.5	55.880	114	33.05	86	8.547	136	45.30	37	16.203	69	32.51	306	16.006	99	44.24	212
29.5	55.994	82	32.19	88	8.683	100	45.67	32	16.272	19	35.57	300	16.105	64	46.36	210
June 8.5	56.076	50	31.31	88	8.783	63	45.99	28	16.291	— 30	38.57	288	16.169	29	48.46	204
18.4	56.126	15	30.43	86	8.846	25	46.27	21	16.261	78	41.45	265	16.198	— 6	50.50	193
28.4	56.141	— 19	29.57	81	8.871	— 14	46.48	17	16.183	124	44.10	237	16.192	42	52.43	176
July 8.4	56.122	50	28.76	74	8.857	49	46.65	11	16.059	165	46.47	203	16.150	75	54.19	153
18.4	56.072	82	28.02	66	8.808	85	46.76	2	15.894	204	48.50	165	16.075	106	55.72	129
28.3	55.990	109	27.36	59	8.723	116	46.78	— 7	15.690	235	50.15	122	15.969	133	57.01	103
Aug. 7.3	55.881	131	26.77	49	8.607	141	46.71	17	15.455	260	51.37	77	15.836	154	58.04	73
17.3	55.750	146	26.28	39	8.466	160	46.54	28	15.195	279	52.14	31	15.682	173	58.77	43
27.2	55.604	156	25.89	27	8.306	169	46.26	37	14.916	287	52.45	— 18	15.509	180	59.20	10
Sept. 6.2	55.448	156	25.62	16	8.137	170	45.89	46	14.629	285	52.27	66	15.329	181	59.30	— 22
16.2	55.292	147	25.46	3	7.967	158	45.43	53	14.344	274	51.61	113	15.148	171	59.08	56
26.2	55.145	128	25.43	— 11	7.809	140	44.90	58	14.070	249	50.48	159	14.977	155	58.52	87
Oct. 6.1	55.017	101	25.54	28	7.669	107	44.32	60	13.821	216	48.89	203	14.822	127	57.65	121
16.1	54.916	65	25.82	44	7.562	68	43.72	58	13.605	173	46.86	244	14.695	93	56.44	152
26.1	54.851	22	26.26	63	7.494	21	43.14	52	13.432	121	44.42	279	14.602	50	54.92	181
Nov. 5.1	54.829	— 25	26.89	82	7.473	— 32	42.62	41	13.311	61	41.63	309	14.552	2	53.11	209
15.0	54.854	74	27.71	101	7.505	87	42.21	27	13.250	— 4	38.54	332	14.550	— 49	51.02	230
25.0	54.928	125	28.72	120	7.592	143	41.94	12	13.254	69	35.22	346	14.599	100	48.72	248
Dec. 5.0	55.053	171	29.92	134	7.735	194	41.82	— 6	13.323	135	31.76	351	14.699	148	46.24	260
14.9	55.224	213	31.26	146	7.929	241	41.88	26	13.458	197	28.25	345	14.847	194	43.64	261
24.9	55.437	251	32.72	153	8.170	279	42.14	43	13.655	252	24.80	327	15.041	233	41.03	255
34.9	55.688		34.25		8.449		42.57		13.907		21.53		15.274		38.48	
Mean Place	52.498		18.92		4.779		32.01		12.953		46.11		12.831		58.45	
Sec δ, Tan δ	1.003		−0.079		1.107		−0.475		1.453		+1.054		1.060		+0.351	
$D_{\psi}\alpha$, $D_{\omega}\alpha$	+0.06		0.00		+0.07		−0.01		+0.04		+0.03		+0.05		+0.01	
$D_{\psi}\delta$, $D_{\omega}\delta$	−0.2		−0.9		−0.2		−0.9		−0.2		−0.9		−0.2		−0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	*η* Ursæ Minoris. Mag. 5.0				*γ* Apodis. Mag. 3.9				*ω* Herculis. Mag. 4.5				*η* Draconis. Mag. 2.9			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	16 19		+75 56		16 20		−78 42		16 21		+14 13		16 22		+61 41	
	s		″		s		″		s		″		s		″	
Jan. 0.9	52.03		39.21		27.44		35.14		31.695		21.94		49.18		57.00	
		54		311		109		186		255		232		34		325
10.9	52.57		36.10		28.53		33.28		31.950		19.62		49.52		53.75	
		68		270		122		141		280		214		40		285
20.9	53.25		33.40		29.75		31.87		32.230		17.48		49.92		50.90	
		79		219		131		92		300		192		45		234
30.8	54.04		31.21		31.06		30.95		32.530		15.56		50.37		48.56	
		87		160		138		44		310		160		50		179
Feb. 9.8	54.91		29.61		32.44		30.51	—	32.840		13.96		50.87		46.77	
		91		94		140		5		311		122		51		112
19.8	55.82		28.67		33.84		30.56		33.151		12.74		51.38		45.65	
		93		27		141		52		309		82		52		46
29.7	56.75		28.40	—	35.25		31.08		33.460		11.92		51.90		45.19	—
		92		41		138		98		298		38		51		22
Mar. 10.7	57.67		28.81		36.63		32.06		33.758		11.54	—	52.41		45.41	
		87		106		132		138		286		6		48		90
20.7	58.54		29.87		37.95		33.44		34.044		11.60		52.89		46.31	
		79		165		125		177		266		46		45		148
30.7	59.33		31.52		39.20		35.21		34.310		12.06		53.34		47.79	
		68		218		113		212		245		85		39		205
Apr. 9.6	60.01		33.70		40.33		37.33		34.555		12.91		53.73		49.84	
		56		262		103		239		222		119		34		252
19.6	60.57		36.32		41.36		39.72		34.777		14.10		54.07		52.36	
		43		296		89		263		196		145		26		286
29.6	61.00		39.28		42.25		42.35		34.973		15.55		54.33		55.22	
		27		317		75		281		168		166		19		312
May 9.6	61.27		42.45		43.00		45.16		35.141		17.21		54.52		58.34	
		12		329		57		293		138		180		13		326
19.5	61.39	—	45.74		43.57		48.09		35.279		19.01		54.65		61.60	
		3		330		40		297		106		188		5		330
29.5	61.36		49.04		43.97		51.06		35.385		20.89		54.70	—	64.90	
		19		321		22		298		71		188		3		324
June 8.5	61.17		52.25		44.19		54.04		35.456		22.77		54.67		68.14	
		33		302		4		287		38		184		9		307
18.4	60.84		55.27		44.23	—	56.91		35.494		24.61		54.58		71.21	
		46		276		14		271		5		174		17		285
28.4	60.38		58.03		44.09		59.62		35.499	—	26.35		54.41		74.06	
		59		242		33		247		31		159		24		252
July 8.4	59.79		60.45		43.76		62.09		35.468		27.94		54.17		76.58	
		70		202		48		216		65		141		30		215
18.4	59.09		62.47		43.28		64.25		35.403		29.35		53.87		78.73	
		79		158		64		179		94		120		35		173
28.3	58.30		64.05		42.64		66.04		35.309		30.55		53.52		80.46	
		87		110		77		135		124		97		39		127
Aug. 7.3	57.43		65.15		41.87		67.39		35.185		31.52		53.13		81.73	
		92		60		86		88		144		70		42		77
17.3	56.51		65.75		41.01		68.27		35.041		32.22		52.71		82.50	
		95		9		93		36		163		45		45		26
27.3	55.56		65.84	—	40.08		68.63	—	34.878		32.67		52.26		82.76	—
		97		43		96		19		172		16		46		25
Sept. 6.2	54.59		65.41		39.12		68.44		34.706		32.83	—	51.80		82.51	
		95		96		95		74		172		13		45		78
16.2	53.64		64.45		38.17		67.70		34.534		32.70		51.35		81.73	
		92		147		90		126		164		41		44		128
26.2	52.72		62.98		37.27		66.44		34.370		32.29		50.91		80.45	
		86		193		80		174		149		71		41		177
Oct. 6.1	51.86		61.05		36.47		64.70		34.221		31.58		50.50		78.68	
		78		236		66		217		122		100		36		224
16.1	51.08		58.69		35.81		62.53		34.099		30.58		50.14		76.44	
		67		278		50		255		87		130		31		266
26.1	50.41		55.91		35.31		59.98		34.012		29.28		49.83		73.78	
		54		312		29		278		46		158		22		302
Nov. 5.1	49.87		52.79		35.02		57.20		33.966	—	27.70		49.61		70.76	
		40		337		9		294		1		182		16		332
15.0	49.47		49.42		34.93	—	54.26		33.967		25.88		49.45		67.44	
		23		358		16		299		50		204		7		356
25.0	49.24		45.84		35.09		51.27		34.017		23.84		49.38	—	63.88	
		6		368		37		292		100		221		2		368
Dec. 5.0	49.18	—	42.16		35.46		48.35		34.117		21.63		49.40		60.20	
		11		366		59		275		149		234		11		370
14.9	49.29		38.50		36.05		45.60		34.266		19.29		49.51		56.50	
		28		354		82		247		194		238		22		362
24.9	49.57		34.96		36.87		43.13		34.460		16.91		49.73		52.88	
		44		331		98		212		231		236		29		341
34.9	50.01		31.65		37.85		41.01		34.691		14.55		50.02		49.47	
Mean Place	56.530		57.77		31.517		38.92		32.083		33.19		51.082		74.65	
Sec δ, Tan δ	4.118		+3.995		5.110		−5.010		1.031		+0.253		2.109		+1.857	
$D_\psi \alpha$, $D_\omega \alpha$	−0.03		+0.11		+0.18		−0.14		+0.05		+0.01		+0.02		+0.05	
$D_\psi \delta$, $D_\omega \delta$	−0.2		−0.9		−0.2		−0.9		−0.2		−0.9		−0.2		−0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Scorpii. (*Antares.*) Mag. 1.2				β Herculis. Mag. 2.8				λ Ophiuchi. Mag. 3.8				A Draconis. Mag. 5.0			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 16 24 s		° ′ −26 14 ″		h m 16 26 s		° ′ +21 39 ″		h m 16 26 s		° ′ + 2 9 ″		h m 16 28 s		° ′ +68 56 ″	
Jan. 0.9	14.891		51.02		35.968		66.06		40.198		52.10		5.58		41.98	
10.9	15.189	298	51.48	46	36.219	251	63.49	257	40.454	256	50.28	182	5.97	39	38.73	325
20.9	15.514	325	52.07	59	36.498	279	61.11	238	40.735	281	48.53	175	6.45	48	35.88	285
30.8	15.855	341	52.79	72	36.799	301	59.04	207	41.033	298	46.93	160	7.00	55	33.53	235
Feb. 9.8	16.207	352	53.58	79	37.111	312	57.34	170	41.341	308	45.52	141	7.61	61	31.75	178
19.8	16.560	353	54.40	82	37.429	318	56.07	127	41.652	311	44.38	114	8.26	65	30.62	113
29.7	16.909	349	55.23	83	37.744	315	55.27	80	41.958	306	43.53	85	8.92	66	30.17	45
Mar. 10.7	17.246	337	56.04	81	38.049	305	54.97	30	42.257	299	42.99	54	9.56	64	30.40	23
20.7	17.570	324	56.80	76	38.342	293	55.17	20	42.543	286	42.79	20	10.18	62	31.31	91
30.7	17.876	306	57.50	70	38.617	275	55.84	67	42.812	269	42.92	13	10.75	57	32.83	152
Apr. 9.6	18.162	286	58.15	65	38.869	252	56.94	110	43.062	250	43.33	41	11.25	50	34.89	206
19.6	18.425	263	58.74	59	39.098	229	58.40	146	43.290	228	44.01	68	11.68	43	37.43	254
29.6	18.663	238	59.27	53	39.298	200	60.18	178	43.494	204	44.91	90	12.02	34	40.31	288
May 9.6	18.872	209	59.75	48	39.468	170	62.19	201	43.673	179	45.98	107	12.25	23	43.46	315
19.5	19.050	178	60.18	43	39.607	139	64.35	216	43.823	150	47.18	120	12.39	14	46.77	331
29.5	19.196	146	60.57	39	39.712	105	66.59	224	43.943	120	48.44	126	12.43	4	50.11	334
June 8.5	19.305	109	60.93	36	39.781	69	68.83	224	44.032	89	49.73	129	12.37	6	53.38	327
18.4	19.376	71	61.25	32	39.814	33	71.00	217	44.087	55	51.00	127	12.21	16	56.50	312
28.4	19.409	33	61.52	27	39.812	2	73.05	205	44.107	20	52.22	122	11.94	27	59.38	288
July 8.4	19.402	7	61.74	22	39.772	40	74.92	187	44.094	13	53.35	113	11.60	34	61.94	256
18.4	19.358	44	61.88	14	39.698	74	76.57	165	44.046	48	54.37	102	11.18	42	64.12	218
28.3	19.276	82	61.95	7	39.591	107	77.97	140	43.967	79	55.27	90	10.69	49	65.87	175
Aug. 7.3	19.162	114	61.93	2	39.456	135	79.08	111	43.859	108	56.01	74	10.14	55	67.16	129
17.3	19.023	139	61.81	12	39.297	159	79.88	80	43.728	131	56.61	60	9.55	59	67.95	79
27.3	18.862	161	61.58	23	39.121	176	80.37	49	43.580	148	57.04	43	8.94	61	68.23	28
Sept. 6.2	18.690	172	61.24	34	38.935	186	80.51	14	43.420	160	57.29	25	8.31	63	67.98	25
16.2	18.517	173	60.81	43	38.747	188	80.31	20	43.259	161	57.36	7	7.68	63	67.21	77
26.2	18.353	164	60.29	52	38.567	180	79.75	56	43.104	155	57.25	11	7.07	61	65.93	128
Oct. 6.1	18.208	145	59.71	58	38.404	163	78.86	89	42.965	139	56.93	32	6.50	57	64.16	177
16.1	18.094	114	59.10	61	38.265	139	77.62	124	42.852	113	56.40	53	5.98	52	61.92	224
26.1	18.019	75	58.50	60	38.162	103	76.05	157	42.773	79	55.66	74	5.54	44	59.26	266
Nov. 5.1	17.991	28	57.94	56	38.101	61	74.19	186	42.735	38	54.70	96	5.18	36	56.23	303
15.0	18.015	24	57.47	47	38.086	15	72.03	216	42.743	8	53.53	117	4.93	25	52.90	333
25.0	18.095	80	57.12	35	38.122	36	69.65	238	42.799	56	52.17	136	4.79	14	49.34	356
Dec. 5.0	18.229	134	56.93	19	38.210	88	67.08	257	42.905	106	50.62	155	4.76	3	45.65	369
15.0	18.416	187	56.91	2	38.348	138	64.41	267	43.058	153	48.93	169	4.85	9	41.93	372
24.9	18.650	234	57.08	17	38.534	186	61.71	270	43.255	197	47.15	178	5.07	22	38.31	362
34.9	18.925	275	57.41	33	38.760	226	59.06	265	43.488	233	45.34	181	5.39	32	34.90	341
Mean Place	15.249		47.60		36.454		78.47		40.530		60.96		8.454		59.63	
Sec δ, Tan δ	1.115		−0.493		1.076		+0.397		1.001		+0.038		2.783		+2.598	
$D_\psi \alpha$, $D_\omega \alpha$	+0.07		−0.01		+0.05		+0.01		+0.06		0.00		0.00		+0.07	
$D_\psi \delta$, $D_\omega \delta$	−0.2		−0.9		−0.2		−0.9		−0.2		−0.9		−0.2		−0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	τ Scorpii. Mag. 2.9				σ Herculis. Mag. 4.2				ζ Ophiuchi. Mag. 2.7				24 Scorpii. Mag. 5.0			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 16 30		° ′ −28 2		h m 16 31		° ′ +42 36		h m 16 32		° ′ −10 23		h m 16 36		° ′ −17 34	
	s		″		s		″		s		″		s		″	
Jan. 0.9	38.625		37.22		22.746		19.14		31.569		58.69		42.406		54.87	
10.9	38.922	297	37.54	32	23.007	261	16.02	312	31.832	263	59.90	121	42.677	271	55.69	82
20.9	39.247	325	38.01	47	23.309	302	13.22	280	32.121	289	61.13	123	42.975	298	56.58	89
30.8	39.590	343	38.60	59	23.643	334	10.83	239	32.430	309	62.32	119	43.291	316	57.51	93
Feb. 9.8	39.945	355	39.29	69	23.998	355	8.94	189	32.746	316	63.44	112	43.617	326	58.42	91
		357		74		366		131		320		99		331		86
19.8	40.302		40.03		24.364		7.63		33.066		64.43		43.948		59.28	
29.7	40.657	355	40.79	76	24.731	367	6.92	71	33.383	317	65.25	82	44.276	328	60.05	77
Mar. 10.7	41.001	344	41.56	77	25.091	360	6.84	8 —	33.691	308	65.88	63	44.597	321	60.70	65
20.7	41.332	331	42.30	74	25.435	344	7.38	54	33.988	297	66.31	43	44.905	308	61.23	53
30.7	41.648	316	43.00	70	25.756	321	8.50	112	34.270	282	66.52	21	45.200	295	61.62	39
		294		67		293		165		263		2		276		25
Apr. 9.6	41.942		43.67		26.049		10.15		34.533		66.54	—	45.476		61.87	
19.6	42.214	272	44.29	62	26.308	259	12.25	210	34.777	244	66.38	16	45.731	255	62.01	14
29.6	42.461	247	44.87	58	26.529	221	14.73	248	34.997	220	66.06	32	45.964	233	62.04	3 —
May 9.6	42.679	218	45.41	54	26.710	181	17.47	274	35.192	195	65.63	43	46.170	206	61.98	6
19.5	42.867	188	45.92	51	26.847	137	20.38	291	35.358	166	65.12	51	46.349	179	61.86	12
		153		47		92		298		138		57		148		16
29.5	43.020		46.39		26.939		23.36		35.496		64.55		46.497		61.70	
June 8.5	43.137	117	46.84	45	26.983	44	26.33	297	35.600	104	63.94	61	46.610	113	61.50	20
18.4	43.216	79	47.24	40	26.983	0	29.20	287	35.669	69	63.34	60	46.689	79	61.29	21
28.4	43.255	39 —	47.61	37	26.935	48	31.88	268	35.704	35 —	62.74	60	46.731	42	61.08	21
July 8.4	43.254	1	47.92	31	26.842	93	34.33	245	35.703	1	62.17	57	46.736	5 —	60.86	22
		41		23		135		212		37		53		33		22
18.4	43.213		48.15		26.707		36.45		35.666		61.64		46.703		60.64	
28.3	43.135	78	48.30	15	26.534	173	38.22	177	35.595	71	61.14	50	46.634	69	60.41	23
Aug. 7.3	43.022	113	48.36	6 —	26.327	207	39.58	136	35.494	101	60.70	44	46.534	100	60.17	24
17.3	42.882	140	48.30	6	26.094	233	40.54	96	35.367	127	60.30	40	46.406	128	59.90	27
27.3	42.719	163	48.13	17	25.840	254	41.03	49	35.222	145	59.94	36	46.258	148	59.63	27
		174		31		264		3		158		30		161		29
Sept. 6.2	42.545		47.82		25.576		41.06	—	35.064		59.64		46.097		59.34	
16.2	42.368	177	47.40	42	25.310	266	40.62	44	34.903	161	59.41	23	45.932	165	59.04	30
26.2	42.199	169	46.88	52	25.053	257	39.72	90	34.749	154	59.25	16	45.772	160	58.74	30
Oct. 6.1	42.047	152	46.28	60	24.814	239	38.36	136	34.610	139	59.17	8 —	45.628	144	58.46	28
16.1	41.926	121	45.63	65	24.606	208	36.56	180	34.498	112	59.19	2	45.512	116	58.22	24
		82		67		169		221		78		14		82		18
26.1	41.844		44.96		24.437		34.35		34.420		59.33		45.430		58.04	
Nov. 5.1	41.809	35 —	44.31	65	24.316	121	31.77	258	34.384	36 —	59.62	29	45.390	40 —	57.94	10 —
15.0	41.826	17	43.73	58	24.250	66	28.89	288	34.395	11	60.06	44	45.400	10	57.96	2
25.0	41.899	73	43.26	47	24.243	7 —	25.73	316	34.456	61	60.67	61	45.461	61	58.12	16
Dec. 5.0	42.028	129	42.94	32	24.300	57	22.42	331	34.567	111	61.45	78	45.574	113	58.44	32
		183		17		118		340		159		92		163		46
15.0	42.211		42.77	—	24.418		19.02		34.726		62.37		45.737		58.90	
24.9	42.443	232	42.78	1	24.594	176	15.64	338	34.930	204	63.42	105	45.945	208	59.51	61
34.9	42.716	273	42.97	19	24.824	230	12.41	323	35.171	241	64.57	115	46.192	247	60.25	74
Mean Place	39.012		33.99		23.682		34.34		31.894		52.23		42.753		49.68	
Sec δ, Tan δ	1.133		−0.533		1.358		+0.920		1.017		−0.184		1.049		−0.317	
$D_\psi \alpha$, $D_\omega \alpha$	+0.07		−0.01		+0.04		+0.02		+0.07		0.00		+0.07		−0.01	
$D_\psi \delta$, $D_\omega \delta$	−0.2		−0.9		−0.2		−0.9		−0.1		−0.9		−0.1		−0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ζ Herculis. Mag. 3.0				α Triang. Aust. Mag. 1.9				η Herculis. Mag. 3.6				Groombridge 2377. Mag. 4.9			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 16 38		° ′ +31 44		h m 16 39		° ′ −68 52		h m 16 40		° ′ +39 4		h m 16 43		° ′ +56 55	
	s		″		s		″		s		″		s		″	
Jan. 0.9	6.458		62.11		43.51		28.66		0.047		38.49		40.495		38.32	
10.9	6.702	244	59.22	289	44.11	60	26.94	172	0.295	248	35.41	308	40.775	280	34.99	333
20.9	6.978	276	56.60	262	44.79	68	25.58	136	0.581	286	32.61	280	41.116	341	32.00	299
30.8	7.282	304	54.32	228	45.52	73	24.64	94	0.899	318	30.21	240	41.506	390	29.47	253
Feb. 9.8	7.603	321	52.47	185	46.29	77	24.12	52	1.238	339	28.27	194	41.933	427	27.46	201
19.8	7.933	330	51.12	135	47.09	80	24.01	11	1.589	351	26.89	138	42.384	451	26.07	139
29.8	8.264	331	50.30	82	47.88	79	24.32	— 31	1.941	352	26.09	80	42.844	460	25.34	73
Mar. 10.7	8.589	325	50.07	23	48.67	79	25.01	69	2.288	347	25.90	19	43.300	456	25.27	7
20.7	8.902	313	50.40	— 33	49.43	76	26.07	106	2.622	334	26.31	— 41	43.740	440	25.88	— 61
30.7	9.196	294	51.27	87	50.16	73	27.45	138	2.937	315	27.30	99	44.152	412	27.12	124
Apr. 9.6	9.468	272	52.63	136	50.84	68	29.14	169	3.227	290	28.82	152	44.529	377	28.92	180
19.6	9.712	244	54.41	178	51.47	63	31.08	194	3.486	250	30.80	198	44.860	331	31.23	231
29.6	9.926	214	56.55	214	52.02	55	33.25	217	3.711	225	33.13	233	45.137	277	33.93	270
May 9.6	10.108	182	58.96	241	52.50	48	35.59	234	3.900	189	35.76	263	45.357	220	36.94	301
19.5	10.253	145	61.55	259	52.91	41	38.06	247	4.047	147	38.57	281	45.515	158	40.13	319
29.5	10.360	107	64.22	267	53.22	31	40.60	254	4.152	105	41.48	291	45.609	94	43.42	329
June 8.5	10.428	68	66.91	269	53.44	22	43.15	255	4.214	62	44.39	291	45.639	30	46.70	328
18.5	10.456	28	69.51	260	53.54	10	45.66	251	4.230	16	47.21	282	45.602	— 37	49.87	317
28.4	10.443	— 13	71.98	247	53.56	2	48.06	240	4.202	— 28	49.87	266	45.500	102	52.85	298
July 8.4	10.390	53	74.25	227	53.48	— 8	50.29	223	4.131	71	52.30	243	45.340	160	55.55	270
18.4	10.300	90	76.24	199	53.30	18	52.26	197	4.018	113	54.45	215	45.123	217	57.94	239
28.3	10.173	127	77.93	169	53.03	27	53.93	167	3.866	152	56.25	180	44.855	268	59.93	199
Aug. 7.3	10.015	158	79.29	136	52.67	36	55.24	131	3.682	184	57.68	143	44.542	313	61.48	155
17.3	9.831	184	80.27	98	52.25	42	56.14	90	3.469	213	58.71	103	44.194	348	62.56	108
27.3	9.626	205	80.86	59	51.79	46	56.60	46	3.236	233	59.31	60	43.819	375	63.16	60
Sept. 6.2	9.409	217	81.05	19	51.29	50	56.57	— 3	2.990	246	59.46	15	43.430	389	63.25	9
16.2	9.190	219	80.82	— 23	50.80	49	56.07	50	2.740	250	59.15	— 31	43.036	394	62.82	— 43
26.2	8.977	213	80.17	65	50.31	49	55.10	97	2.497	243	58.40	75	42.651	385	61.87	95
Oct. 6.2	8.779	198	79.12	105	49.89	42	53.68	142	2.270	227	57.20	120	42.289	362	60.43	144
16.1	8.607	172	77.68	144	49.52	37	51.85	183	2.071	199	55.56	164	41.961	328	58.52	191
26.1	8.470	137	75.84	184	49.24	28	49.69	216	1.908	163	53.52	204	41.681	280	56.16	236
Nov. 5.1	8.375	95	73.66	218	49.06	18	47.29	240	1.791	117	51.12	240	41.459	222	53.40	276
15.0	8.331	44	71.17	249	49.00	6	44.71	258	1.726	65	48.38	274	41.304	155	50.29	311
25.0	8.339	— 8	68.43	274	49.07	— 7	42.07	264	1.718	8	45.37	301	41.226	78	46.92	337
Dec. 5.0	8.401	62	65.50	293	49.27	20	39.49	258	1.770	— 52	42.18	319	41.228	— 2	43.35	357
15.0	8.518	117	62.45	305	49.59	32	37.02	247	1.880	110	38.90	328	41.311	83	39.71	364
24.9	8.687	169	59.41	304	50.03	44	34.77	225	2.045	165	35.61	329	41.472	161	36.10	361
34.9	8.902	215	56.44	297	50.57	54	32.82	195	2.262	217	32.43	318	41.708	236	32.65	345
Mean Place	7.157		75.50		45.431		30.55		0.928		52.71		42.208		53.99	
Sec δ, Tan δ	1.176		+0.619		2.775		−2.589		1.288		+0.812		1.833		+1.536	
$D_\psi\,\alpha$, $D_\omega\,\alpha$	+0.05		+0.01		+0.13		−0.06		+0.04		+0.02		+0.02		+0.03	
$D_\psi\,\delta$, $D_\omega\,\delta$	−0.1		−0.9		−0.1		−0.9		−0.1		−0.9		−0.1		−0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ε Scorpii. Mag. 2.4				49 Herculis. Mag. 6.4				ε¹ Aræ. Mag. 4.2				κ Ophiuchi. Mag. 3.4			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	16 44		−34 8		16 48		+15 6		16 52		−53 1		16 53		+9 29	
	s		″		s		″		s		″		s		″	
Jan. 0.9	42.672	300	33.59	10	14.860	232	40.74	233	52.084	380	58.59	116	41.017	229	67.60	208
10.9	42.972	332	33.49	7	15.092	263	38.41	218	52.464	426	57.43	88	41.246	259	65.52	198
20.9	43.304	356	33.56	25	15.355	285	36.23	196	52.890	462	56.55	57	41.505	281	63.54	180
30.8	43.660	368	33.81	39	15.640	299	34.27	165	53.352	484	55.98	28	41.786	295	61.74	153
Feb. 9.8	44.028	375	34.20	50	15.939	308	32.62	128	53.836	497	55.70	1	42.081	303	60.21	122
19.8	44.403	374	34.70	59	16.247	308	31.34	86	54.333	501	55.69	29	42.384	305	58.99	85
29.8	44.777	368	35.29	65	16.555	302	30.48	43	54.834	494	55.98	53	42.689	301	58.14	47
Mar. 10.7	45.145	356	35.94	71	16.857	294	30.05	1	55.328	482	56.51	77	42.990	292	57.67	6
20.7	45.501	341	36.65	73	17.151	280	30.06	46	55.810	463	57.28	98	43.282	279	57.61	32
30.7	45.842	322	37.38	75	17.431	262	30.52	86	56.273	439	58.26	119	43.561	263	57.93	69
Apr. 9.7	46.164	299	38.13	76	17.693	242	31.38	121	56.712	409	59.45	134	43.824	245	58.62	100
19.6	46.463	275	38.89	78	17.935	217	32.59	150	57.121	374	60.79	149	44.069	223	59.62	129
29.6	46.738	245	39.67	78	18.152	192	34.09	174	57.495	333	62.28	161	44.292	197	60.91	149
May 9.6	46.983	212	40.45	78	18.344	162	35.83	190	57.828	288	63.89	169	44.489	169	62.40	164
19.5	47.195	177	41.23	78	18.506	131	37.73	199	58.116	236	65.58	176	44.658	140	64.04	173
29.5	47.372	138	42.01	77	18.637	98	39.72	201	58.352	182	67.34	177	44.798	106	65.77	176
June 8.5	47.510	97	42.78	74	18.735	61	41.73	199	58.534	124	69.11	176	44.904	71	67.53	174
18.5	47.607	52	43.52	70	18.796	24	43.72	189	58.658	63	70.87	168	44.975	35	69.27	165
28.4	47.659	8	44.22	65	18.820	12	45.61	176	58.721	0	72.55	158	45.010	0	70.92	155
July 8.4	47.667	36	44.87	55	18.808	48	47.37	157	58.721	60	74.13	143	45.010	38	72.47	140
18.4	47.631	78	45.42	45	18.760	82	48.94	137	58.661	116	75.56	121	44.972	72	73.87	123
28.4	47.553	116	45.87	30	18.678	114	50.31	111	58.545	172	76.77	96	44.900	104	75.10	101
Aug. 7.3	47.437	147	46.17	16	18.564	140	51.42	88	58.373	215	77.73	68	44.796	131	76.11	80
17.3	47.290	175	46.33	1	18.424	162	52.30	59	58.158	250	78.41	34	44.665	152	76.91	58
27.3	47.115	189	46.32	20	18.262	174	52.89	31	57.908	272	78.75	1	44.513	168	77.49	33
Sept. 6.2	46.926	195	46.12	37	18.088	179	53.20	2	57.636	281	78.76	36	44.345	174	77.82	9
16.2	46.731	189	45.75	54	17.909	177	53.22	30	57.355	275	78.40	71	44.171	170	77.91	17
26.2	46.542	170	45.21	70	17.732	161	52.92	59	57.080	251	77.69	104	44.001	158	77.74	43
Oct. 6.2	46.372	143	44.51	81	17.571	141	52.33	89	56.829	215	76.65	132	43.843	136	77.31	70
16.1	46.229	102	43.70	89	17.430	108	51.44	120	56.614	163	75.33	158	43.707	106	76.61	95
26.1	46.127	55	42.81	92	17.322	70	50.24	148	56.451	99	73.75	176	43.601	68	75.66	121
Nov. 5.1	46.072	2	41.89	91	17.252	26	48.76	175	56.352	27	71.99	187	43.533	24	74.45	145
15.1	46.074	60	40.98	85	17.226	23	47.01	198	56.325	51	70.12	190	43.509	24	73.00	169
25.0	46.134	118	40.13	73	17.249	73	45.03	218	56.376	130	68.22	186	43.533	72	71.31	185
Dec. 5.0	46.252	175	39.40	59	17.322	122	42.85	230	56.506	208	66.36	175	43.605	121	69.46	201
15.0	46.427	229	38.81	43	17.444	168	40.55	238	56.714	280	64.61	156	43.726	165	67.45	208
24.9	46.656	272	38.38	23	17.612	208	38.17	236	56.994	343	63.05	134	43.891	206	65.37	210
34.9	46.928		38.15		17.820		35.81		57.337		61.71		44.097		63.27	
Mean Place	43.148		30.98		15.353		51.28		52.977		58.16		41.476		77.13	
Sec δ, Tan δ	1.209		−0.678		1.036		+0.270		1.663		−1.329		1.014		+0.167	
$D_\psi \alpha$, $D_\omega \alpha$	+0.08		−0.01		+0.05		+0.01		+0.09		−0.03		+0.06		0.00	
$D_\psi \delta$, $D_\omega \delta$	−0.1		*−0.9*		*−0.1*		−1.0		−0.1		−1.0		−0.1		−1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	**30 Ophiuchi.** Mag. 5.0				ε **Herculis.** Mag. 3.9				*d* **Herculis.** Mag. 5.3				η **Ophiuchi.** Mag. 2.6			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 16 56		° ′ − 4 5		h m 16 57		° ′ +31 2		h m 16 58		° ′ +33 40		h m 17 5		° ′ −15 37	
	s		″		s		″		s		″		s		″	
Jan. 0.9	37.440		53.44		3.744		45.48		29.373		68.37		33.108		24.34	
10.9	37.678	238	59.87	143	3.969	225	42.57	291	29.598	225	65.39	298	33.352	244	25.11	77
20.9	37.944	266	61.27	140	4.231	262	39.90	267	29.859	261	62.64	275	33.626	274	25.92	81
30.8	38.230	286	62.60	133	4.520	289	37.54	236	30.153	294	60.23	241	33.923	297	26.75	83
Feb. 9.8	38.532	302	63.78	118	4.831	311	35.60	194	30.467	314	58.25	198	34.235	312	27.54	79
19.8	38.840	308	64.78	100	5.154	323	34.14	146	30.795	328	56.76	149	34.554	319	28.24	70
29.8	39.149	309	65.54	76	5.482	328	33.22	92	31.129	334	55.82	94	34.877	323	28.85	61
Mar. 10.7	39.453	304	66.05	51	5.807	325	32.85	37	31.462	333	55.46	36	35.196	319	29.33	48
20.7	39.751	298	66.29	24	6.124	317	33.04	19	31.785	323	55.66	20	35.509	313	29.65	32
30.7	40.037	286	66.27	2	6.426	302	33.79	75	32.094	309	56.45	79	35.811	302	29.81	16
Apr. 9.7	40.308	271	65.99	28	6.710	284	35.03	124	32.382	288	57.74	129	36.100	289	29.84	3
19.6	40.560	252	65.50	49	6.969	259	36.72	169	32.646	264	59.50	176	36.373	273	29.73	11
29.6	40.793	233	64.80	70	7.201	232	38.79	207	32.883	237	61.64	214	36.625	252	29.50	23
May 9.6	41.001	208	63.96	84	7.402	201	41.14	235	33.087	204	64.06	242	36.854	229	29.20	30
19.5	41.183	182	63.02	94	7.568	166	43.70	256	33.253	166	66.71	265	37.057	203	28.84	36
29.5	41.336	153	62.01	101	7.697	129	46.38	268	33.383	130	69.48	277	37.229	172	28.45	39
June 8.5	41.457	121	60.96	105	7.788	91	49.08	270	33.471	88	72.28	280	37.370	141	28.05	40
18.5	41.544	87	59.93	103	7.837	49	51.75	267	33.518	47	75.04	276	37.474	104	27.65	40
28.4	41.594	50	58.94	99	7.845	8	54.28	253	33.522	4	77.66	262	37.541	67	27.27	38
July 8.4	41.607	13	58.01	93	7.811	34	56.64	236	33.482	40	80.10	244	37.568	27	26.91	36
18.4	41.584	23	57.16	85	7.737	74	58.74	210	33.403	79	82.27	217	37.556	12	26.59	32
28.4	41.525	59	56.42	74	7.625	112	60.57	183	33.285	118	84.18	191	37.507	49	26.30	29
Aug. 7.3	41.435	90	55.78	64	7.480	145	62.07	150	33.130	155	85.74	156	37.421	86	26.02	28
17.3	41.316	119	55.24	54	7.304	176	63.21	114	32.947	183	86.91	117	37.305	116	25.77	25
27.3	41.174	142	54.82	42	7.107	197	63.96	75	32.740	207	87.70	79	37.164	141	25.53	24
Sept. 6.2	41.017	157	54.51	31	6.893	214	64.32	36	32.519	221	88.07	37	37.006	158	25.31	22
16.2	40.853	164	54.34	17	6.673	220	64.27	5	32.289	230	88.00	7	36.838	168	25.09	22
26.2	40.692	161	54.30	4	6.455	218	63.81	46	32.060	229	87.53	47	36.672	166	24.88	21
Oct. 6.2	40.542	150	54.39	9	6.252	203	62.94	87	31.848	212	86.62	91	36.517	155	24.71	17
16.1	40.415	127	54.64	25	6.070	182	61.66	128	31.656	192	85.28	134	36.384	133	24.57	14
26.1	40.317	98	55.04	40	5.921	149	59.98	168	31.497	159	83.55	173	36.282	102	24.49	8
Nov. 5.1	40.259	58	55.61	57	5.812	109	57.95	203	31.379	118	81.44	211	36.218	64	24.49	0
15.1	40.244	15	56.37	76	5.749	63	55.60	235	31.309	70	79.00	244	36.201	17	24.59	10
25.0	40.277	33	57.28	91	5.739	10	52.96	264	31.292	17	76.29	271	36.233	32	24.82	23
Dec. 5.0	40.359	82	58.36	108	5.782	43	50.13	283	31.331	39	73.35	294	36.315	82	25.17	35
15.0	40.489	130	59.59	123	5.881	99	47.15	298	31.422	91	70.29	306	36.448	133	25.65	48
24.9	40.663	174	60.92	133	6.030	149	44.13	302	31.569	147	67.18	311	36.626	178	26.25	60
34.9	40.877	214	62.31	139	6.226	196	41.17	296	31.762	193	64.12	306	36.846	220	26.96	71
Mean Place	37.836		51.02		4.510		57.72		30.204		80.81		33.513		18.62	
Sec δ, Tan δ	1.003		−0.072		1.167		+0.602		1.202		+0.667		1.039		−0.280	
$D_\psi \alpha$, $D_\omega \alpha$	+0.06		0.00		+0.05		+0.01		+0.04		+0.01		+0.07		0.00	
$D_\psi \delta$, $D_\omega \delta$	−0.1		−1.0		−0.1		−1.0		−0.1		−1.0		−0.1		−1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	η Scorpii. Mag. 3.4				ζ Draconis. Mag. 3.2				α Herculis. Var. 3.1–3.9				δ Herculis. Mag. 3.2			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 17 6		° ′ −43 7		h m 17 8		° ′ +65 48		h m 17 10		° ′ +14 28		h m 17 11		° ′ +21 55	
	s		″		s		″		s		″		s		″	
Jan. 0.9	7.378	312	49.31	75	29.62	28	50.73	343	48.441	213	57.09	229	34.131	210	64.20	271
10.9	7.690	352	48.56	55	29.90	36	47.30	314	48.654	246	54.80	214	34.341	244	61.49	252
20.9	8.042	381	48.01	33	30.26	44	44.16	273	48.900	270	52.66	195	34.585	274	58.97	225
30.9	8.423	403	47.68	13	30.70	50	41.43	221	49.170	288	50.71	166	34.859	294	56.72	191
Feb. 9.8	8.826	414	47.55	— 6	31.20	54	39.22	163	49.458	298	49.05	130	35.153	308	54.81	147
19.8	9.240	419	47.61	25	31.74	57	37.59	96	49.756	306	47.75	92	35.461	314	53.34	99
29.8	9.659	417	47.86	40	32.31	58	36.63	30	50.062	302	46.83	47	35.775	314	52.35	46
Mar. 10.7	10.076	408	48.26	54	32.89	58	36.33	— 40	50.364	298	46.36	3	36.089	307	51.89	— 5
20.7	10.484	394	48.80	68	33.47	54	36.73	104	50.662	287	46.33	— 40	36.396	298	51.94	57
30.7	10.878	378	49.48	78	34.01	51	37.77	165	50.949	274	46.73	81	36.694	283	52.51	104
Apr. 9.7	11.256	355	50.26	88	34.52	45	39.42	219	51.223	256	47.54	118	36.977	262	53.55	147
19.6	11.611	329	51.14	98	34.97	38	41.61	263	51.479	235	48.72	148	37.239	239	55.02	183
29.6	11.940	297	52.12	106	35.35	31	44.24	299	51.714	210	50.20	173	37.478	212	56.85	213
May 9.6	12.237	263	53.18	112	35.66	22	47.23	322	51.924	184	51.93	190	37.690	180	58.98	233
19.6	12.500	222	54.30	119	35.88	13	50.45	336	52.108	152	53.83	201	37.870	148	61.31	246
29.5	12.722	178	55.49	120	36.01	5	53.81	340	52.260	118	55.84	206	38.018	111	63.77	251
June 8.5	12.900	131	56.69	121	36.06	— 3	57.21	334	52.378	83	57.90	203	38.129	72	66.28	248
18.5	13.031	80	57.90	117	36.03	14	60.55	319	52.461	46	59.93	197	38.201	32	68.76	240
28.4	13.111	28	59.07	113	35.89	22	63.74	295	52.507	7	61.90	184	38.233	— 8	71.16	224
July 8.4	13.139	— 23	60.20	103	35.67	29	66.69	264	52.514	— 31	63.74	166	38.225	47	73.40	203
18.4	13.116	74	61.23	90	35.38	36	69.33	228	52.483	68	65.40	147	38.178	87	75.43	178
28.4	13.042	120	62.13	72	35.02	43	71.61	185	52.415	101	66.87	124	38.091	121	77.21	149
Aug. 7.3	12.922	160	62.85	52	34.59	49	73.46	141	52.314	132	68.11	98	37.970	151	78.70	117
17.3	12.762	192	63.37	29	34.10	52	74.87	91	52.182	154	69.09	71	37.819	177	79.87	83
27.3	12.570	215	63.66	5	33.58	54	75.78	40	52.028	173	69.80	44	37.642	194	80.70	49
Sept. 6.3	12.355	226	63.71	— 23	33.04	56	76.18	— 13	51.855	181	70.24	14	37.448	202	81.19	10
16.2	12.129	224	63.48	48	32.48	56	76.05	64	51.674	181	70.38	— 16	37.246	203	81.29	— 27
26.2	11.905	207	63.00	74	31.92	53	75.41	118	51.493	170	70.22	45	37.043	192	81.02	65
Oct. 6.2	11.698	180	62.26	95	31.39	49	74.23	166	51.323	152	69.77	76	36.851	173	80.37	102
16.1	11.518	139	61.31	115	30.90	44	72.57	214	51.171	123	69.01	104	36.678	144	79.35	138
26.1	11.379	88	60.16	127	30.46	38	70.43	258	51.048	87	67.97	135	36.534	106	77.97	173
Nov. 5.1	11.291	30	58.89	134	30.08	30	67.85	297	50.961	44	66.62	162	36.428	62	76.24	205
15.1	11.261	— 35	57.55	136	29.78	20	64.88	328	50.917	— 2	65.00	185	36.366	14	74.19	231
25.0	11.296	101	56.19	133	29.58	10	61.60	350	50.919	51	63.15	206	36.352	— 37	71.88	255
Dec. 5.0	11.397	167	54.86	121	29.48	0	58.10	363	50.970	100	61.09	220	36.389	88	69.33	269
15.0	11.564	226	53.65	108	29.48	11	54.47	365	51.070	146	58.89	229	36.477	137	66.64	276
25.0	11.790	280	52.57	90	29.59	21	50.82	354	51.216	187	56.60	230	36.614	183	63.88	274
34.9	12.070		51.67		29.80		47.28		51.403		54.30		36.797		61.14	
Mean Place	8.027		47.17		32.474		64.72		48.996		66.70		34.833		74.97	
Sec δ, Tan δ	1.370		−0.937		2.441		+2.227		1.033		+0.258		1.103		+0.465	
Dψ α, Dω α	+0.09		−0.01		0.00		+0.03		+0.05		0.00		+0.05		+0.01	
Dψ δ, Dω δ	−0.1		−1.0		−0.1		−1.0		−0.1		−1.0		−0.1		−1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	**π Herculis.** Mag. 3.4				**θ Ophiuchi.** Mag. 3.4				**ω Herculis.** Mag. 5.4				**β Aræ.** Mag. 2.8			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 17 12 s		° ′ +36 53 ″		h m 17 16 s		° ′ −24 55 ″		h m 17 17 s		° ′ +32 34 ″		h m 17 18 s		° ′ −55 27 ″	
Jan. 0.9	6.257		59.40		50.484		4.97		30.044		18.85		17.822		7.56	
		210		307		251		19		205		298		363		150
10.9	6.467		56.33		50.735		5.16		30.249		15.87		18.185		6.06	
		253		286		282		28		245		279		418		125
20.9	6.720		53.47		51.017		5.44		30.494		13.08		18.603		4.81	
		287		252		309		35		274		248		460		98
30.9	7.007		50.95		51.326		5.79		30.768		10.60		19.063		3.83	
		313		210		325		40		301		210		492		68
Feb. 9.8	7.320		48.85		51.651		6.19		31.069		8.50		19.555		3.15	
		330		160		335		41		318		160		511		41
19.8	7.650		47.25		51.986		6.60		31.387		6.90		20.066		2.74	
		339		104		341		40		327		109		522		11
29.8	7.989		46.21		52.327		7.00		31.714		5.81		20.588		2.63	—
		341		44		340		36		328		52		523		16
Mar. 10.8	8.330		45.77	—	52.667		7.36		32.042		5.29	—	21.111		2.79	
		335		15		335		31		325		5		517		42
20.7	8.665		45.92		53.002		7.67		32.367		5.34		21.628		3.21	
		323		74		325		26		312		62		504		67
30.7	8.988		46.66		53.327		7.93		32.679		5.96		22.132		3.88	
		304		127		314		20		300		115		483		90
Apr. 9.7	9.292		47.93		53.641		8.13		32.979		7.11		22.615		4.78	
		282		177		296		16		276		160		456		111
19.6	9.574		49.70		53.937		8.29		33.255		8.71		23.071		5.89	
		252		218		278		12		251		203		426		130
29.6	9.826		51.88		54.215		8.41		33.506		10.74		23.497		7.19	
		219		251		254		10		220		234		384		146
May 9.6	10.045		54.39		54.469		8.51		33.726		13.08		23.881		8.65	
		183		273		228		9		189		258		339		162
19.6	10.228		57.12		54.697		8.60		33.915		15.66		24.220		10.27	
		144		289		196		9		150		272		287		172
29.5	10.372		60.01		54.893		8.69		34.065		18.38		24.507		11.99	
		101		293		161		11		111		279		229		180
June 8.5	10.473		62.94		55.054		8.80		34.176		21.17		24.736		13.79	
		56		291		123		13		69		276		168		183
18.5	10.529		65.85		55.177		8.93		34.245		23.93		24.904		15.62	
		11		279		83		13		27		266		101		181
28.5	10.540	—	68.64		55.260		9.06		34.272	—	26.59		25.005		17.43	
		34		261		40		15		18		249		34		175
July 8.4	10.506		71.25		55.300	—	9.21		34.254		29.08		25.039	—	19.18	
		78		237		1		14		60		228		32		162
18.4	10.428		73.62		55.299		9.35		34.194		31.36		25.007		20.80	
		120		206		44		12		102		199		99		146
28.4	10.308		75.68		55.255		9.47		34.092		33.35		24.908		22.26	
		158		172		83		9		138		167		159		122
Aug. 7.3	10.150		77.40		55.172		9.56		33.954		35.02		24.749		23.48	
		190		135		118		4		172		131		212		94
17.3	9.960		78.75		55.054		9.60	—	33.782		36.33		24.537		24.42	
		217		95		146		2		198		92		256		65
27.3	9.743		79.70		54.908		9.58		33.584		37.25		24.281		25.07	
		235		50		167		10		215		54		285		28
Sept. 6.3	9.508		80.20		54.741		9.48		33.369		37.79		23.996		25.35	—
		245		7		177		19		227		11		303		9
16.2	9.263		80.27	—	54.564		9.29		33.142		37.90	—	23.693		25.26	
		244		38		178		25		228		31		303		46
26.2	9.019		79.89		54.386		9.04		32.914		37.59		23.390		24.80	
		233		82		167		34		217		75		287		83
Oct. 6.2	8.786		79.07		54.219		8.70		32.697		36.84		23.103		23.97	
		212		127		147		39		199		116		254		118
16.2	8.574		77.80		54.072		8.31		32.498		35.68		22.849		22.79	
		180		169		115		41		168		157		205		147
26.1	8.394		76.11		53.957		7.90		32.330		34.11		22.644		21.32	
		142		209		75		42		132		195		143		172
Nov. 5.1	8.252		74.02		53.882		7.48		32.198		32.16		22.501		19.60	
		92		244		28		40		85		230		72		189
15.1	8.160		71.58		53.854	—	7.08		32.113		29.86		22.429	—	17.71	
		41		274		24		33		34		260		9		199
25.0	8.119	—	68.84		53.878		6.75		32.079	—	27.26		22.438		15.72	
		16		298		77		23		19		283		91		201
Dec. 5.0	8.135		65.86		53.955		6.52		32.098		24.43		22.529		13.71	
		72		313		130		14		72		299		171		196
15.0	8.207		62.73		54.085		6.38		32.170		21.44		22.700		11.75	
		128		319		179		3		125		306		251		184
25.0	8.335		59.54		54.264		6.35	—	32.295		18.38		22.951		9.91	
		180		314		223		10		174		303		320		165
34.9	8.515		56.40		54.487		6.45		32.469		15.35		23.271		8.26	
Mean Place	7.227		71.30		50.939		0.35		30.923		30.02		18.843		6.14	
Sec δ, Tan δ	1.250		+0.751		1.103		−0.465		1.187		+0.639		1.764		−1.452	
$D_\psi\,\alpha$, $D_\omega\,\alpha$	+0.04		+0.01		+0.07		−0.01		+0.04		+0.01		+0.10		−0.02	
$D_\psi\,\delta$, $D_\omega\,\delta$	−0.1		−1.0		−0.1		−1.0		−0.1		−1.0		−0.1		−1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	b Ophiuchi. Mag. 4.3				σ Ophiuchi. Mag. 4.4				δ Aræ. Mag. 3.8				α Aræ. Mag. 3.0			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 17 21		° ′ −24 5		h m 17 22		° ′ + 4 12		h m 17 23		° ′ −60 36		h m 17 25		° ′ −49 48	
	s		″		s		″		s		″		s		″	
Jan. 0.9	13.832		61.96		20.285		37.10		29.35		57.03		19.912		41.37	
10.9	14.075	243	62.16	20	20.494	209	35.34	176	29.75	40	55.23	180	20.231	319	40.11	126
20.9	14.354	279	62.46	30	20.734	240	33.64	170	30.21	46	53.70	153	20.599	368	39.05	106
30.9	14.654	300	62.82	36	20.999	265	32.08	156	30.72	51	52.47	123	21.005	406	38.22	83
Feb. 9.8	14.976	322	63.22	40	21.282	283	30.71	137	31.27	55	51.54	93	21.439	434	37.63	59
19.8	15.308	332	63.62	40	21.576	294	29.60	111	31.85	58	50.95	59	21.891	452	37.29	34
29.8	15.644	336	63.97	35	21.876	300	28.80	80	32.45	60	50.68	27	22.353	462	37.17	12
Mar. 10.8	15.982	338	64.31	34	22.177	301	28.33	47	33.04	59	50.72	4	22.818	465	37.27	10
20.7	16.317	335	64.60	29	22.474	297	28.21	12	33.63	59	51.07	35	23.279	461	37.59	32
30.7	16.641	324	64.83	23	22.764	290	28.44	23	34.21	58	51.72	65	23.728	449	38.10	51
Apr. 9.7	16.954	313	64.97	14	23.042	278	29.00	56	34.77	56	52.65	93	24.163	435	38.80	70
19.6	17.254	300	65.07	10	23.305	263	29.85	85	35.29	52	53.84	119	24.576	413	39.66	86
29.6	17.532	278	65.13	6	23.550	245	30.95	110	35.78	49	55.25	141	24.961	385	40.69	103
May 9.6	17.787	255	65.16	3	23.773	223	32.25	130	36.22	44	56.87	162	25.314	353	41.87	118
19.6	18.015	228	65.19	3	23.970	197	33.69	144	36.61	39	58.66	179	25.628	314	43.17	130
29.5	18.215	200	65.20	1	24.139	169	35.23	154	36.94	33	60.58	192	25.897	269	44.57	140
June 8.5	18.378	163	65.26	6	24.277	138	36.81	158	37.20	26	62.60	202	26.117	220	46.05	148
18.5	18.506	128	65.33	7	24.379	102	38.37	156	37.39	19	64.67	207	26.284	167	47.57	152
28.5	18.592	86	65.39	6	24.445	66	39.88	151	37.51	12	66.73	206	26.392	108	49.09	152
July 8.4	18.637	45	65.48	9	24.473	28	41.29	141	37.54	3	68.72	199	26.440	48	50.57	148
18.4	18.639	2	65.58	10	24.463	10	42.59	130	37.50	4	70.59	187	26.429	11	51.95	138
28.4	18.597	42	65.67	9	24.416	47	43.73	114	37.39	11	72.27	168	26.358	71	53.21	126
Aug. 7.3	18.517	80	65.76	9	24.333	83	44.71	98	37.20	19	73.71	144	26.233	125	54.28	107
17.3	18.402	115	65.79	3	24.219	114	45.51	80	36.94	26	74.85	114	26.058	175	55.13	85
27.3	18.258	144	65.75	4	24.080	139	46.11	60	36.64	30	75.64	79	25.844	214	55.70	57
Sept. 6.3	18.095	163	65.67	8	23.922	158	46.52	41	36.31	33	76.04	40	25.600	244	55.98	28
16.2	17.918	177	65.51	16	23.752	170	46.72	20	35.95	36	76.04	0	25.339	261	55.95	3
26.2	17.741	177	65.27	24	23.581	171	46.72	0	35.59	36	75.61	43	25.077	262	55.58	37
Oct. 6.2	17.573	168	64.97	30	23.420	161	46.49	23	35.24	35	74.77	84	24.826	251	54.89	69
16.2	17.426	147	64.63	34	23.274	146	46.06	43	34.93	31	73.54	123	24.603	223	53.91	98
26 1	17.310	116	64.28	35	23.156	118	45.40	66	34.69	24	71.96	158	24.422	181	52.67	124
Nov. 5.1	17.233	77	63.90	38	23.073	83	44.52	88	34.50	19	70.10	186	24.293	129	51.21	146
15.1	17.199	34	63.56	34	23.030	43	43.42	110	34.40	10	68.02	208	24.228	65	49.59	162
25.0	17.220	21	63.29	27	23.033	3	42.13	129	34.39	1	65.80	222	24.234	6	47.90	169
Dec. 5.0	17.292	72	63.09	20	23.083	50	40.66	147	34.47	8	63.53	227	24.311	77	46.18	172
15.0	17.417	125	62.98	11	23.181	98	39.04	162	34.64	17	61.29	224	24.462	151	44.52	166
25.0	17.591	174	63.00	2	23.323	142	37.33	171	34.91	27	59.17	212	24.680	218	42.96	156
34.9	17.808	217	63.14	14	23.506	183	35.57	176	35.26	35	57.21	196	24.961	281	41.55	141
Mean Place	14.287		57.17		20.777		45.16		30.632		55.76		20.740		39.11	
Sec δ, Tan δ	1.096		−0.447		1.003		+0.074		2.038		−1.776		1.549		−1.184	
$D_\psi \alpha$, $D_\omega \alpha$	+0.07		−0.01		+0.06		0.00		+0.11		−0.02		+0.09		−0.01	
$D_\psi \delta$, $D_\omega \delta$	−0.1		−1.0		−0.1		−1.0		−0.1		−1.0		−0.1		−1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	λ Herculis. Mag. 4.5				λ Scorpii. Mag. 1.7				β Draconis. Mag. 3.0				α Ophiuchi. Mag. 2.1			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 17 27		° ′ +26 10		h m 17 27		° ′ −37 2		h m 17 28		° ′ +52 21		h m 17 31		° ′ +12 36	
	s		″		s		″		s		″		s		″	
Jan. 1.0	19.826		13.57		53.587		40.34		30.335		35.55		1.490		64.26	
		193		273		267		58		201		341		196		216
10.9	20.019		10.84		53.854		39.76		30.536		32.14		1.686		62.10	
		234		258		307		44		260		317		229		206
20.9	20.253		8.26		54.161		39.32		30.796		28.97		1.915		60.04	
		260		233		335		29		312		283		257		189
30.9	20.513		5.93		54.496		39.03		31.108		26.14		2.172		58.15	
		285		196		360		15		355		237		276		162
Feb. 9.8	20.798		3.97		54.856		38.88		31.463		23.77		2.448		56.53	
		303		156		373		3		385		182		290		130
19.8	21.101		2.41		55.229		38.85		31.848		21.95		2.738		55.23	
		312		105		381		8		406		121		299		94
29.8	21.413		1.36		55.610		38.93		32.254		20.74		3.037		54.29	
		314		54		383		17		415		57		301		51
Mar. 10.8	21.727		0.82		55.993		39.10		32.669		20.17		3.338		53.78	
		313		0		379		26		413		10		299		8
20.7	22.040		0.82		56.372		39.36		33.082		20.27		3.637		53.70	
		304		52		371		32		401		75		292		33
30.7	22.344		1.34		56.743		39.68		33.483		21.02		3.929		54.03	
		291		100		359		40		380		135		282		74
Apr. 9.7	22.635		2.34		57.102		40.08		33.863		22.37		4.211		54.77	
		274		145		342		46		350		192		268		110
19.7	22.909		3.79		57.444		40.54		34.213		24.29		4.479		55.87	
		251		185		322		52		313		237		248		140
29.6	23.160		5.64		57.766		41.06		34.526		26.66		4.727		57.27	
		225		216		296		59		269		276		228		167
May 9.6	23.385		7.80		58.062		41.65		34.795		29.42		4.955		58.94	
		196		239		266		66		219		305		201		184
19.6	23.581		10.19		58.328		42.31		35.014		32.47		5.156		60.78	
		161		252		231		72		165		323		171		196
29.5	23.742		12.71		58.559		43.03		35.179		35.70		5.327		62.74	
		127		261		193		76		108		332		140		201
June 8.5	23.869		15.32		58.752		43.79		35.287		39.02		5.467		64.75	
		87		258		148		80		47		331		104		201
18.5	23.956		17.90		58.900		44.59		35.334		42.33		5.571		66.76	
		45		252		103		82		12		321		65		194
28.5	24.001		20.42		59.003		45.41		35.322		45.54		5.636		68.70	
		5		237		54		80		72		302		27		184
July 8.4	24.006		22.79		59.057		46.21		35.250		48.56		5.663		70.54	
		37		217		4		77		129		277		13		168
18.4	23.969		24.96		59.061		46.98		35.121		51.33		5.650		72.22	
		76		193		44		69		183		244		50		149
28.4	23.893		26.89		59.017		47.67		34.938		53.77		5.600		73.71	
		115		164		89		60		233		208		87		127
Aug. 7.4	23.778		28.53		58.928		48.27		34.705		55.85		5.513		74.98	
		149		132		131		47		275		165		120		105
17.3	23.629		29.85		58.797		48.74		34.430		57.50		5.393		76.03	
		175		97		165		30		310		120		145		78
27.3	23.454		30.82		58.632		49.04		34.120		58.70		5.248		76.81	
		194		63		189		13		334		73		167		53
Sept. 6.3	23.260		31.45		58.443		49.17		33.786		59.43		5.081		77.34	
		206		23		203		8		349		22		177		24
16.2	23.054		31.68		58.240		49.09		33.437		59.65		4.904		77.58	
		209		15		207		29		351		28		181		3
26.2	22.845		31.53		58.033		48.80		33.086		59.37		4.723		77.55	
		199		53		197		47		342		80		174		33
Oct. 6.2	22.646		31.00		57.836		48.33		32.744		58.57		4.549		77.22	
		185		91		175		67		319		129		158		62
16.2	22.461		30.09		57.661		47.66		32.425		57.28		4.391		76.60	
		156		131		142		80		286		178		132		89
26.1	22.305		28.78		57.519		46.86		32.139		55.50		4.259		75.71	
		121		166		98		93		240		223		99		118
Nov. 5.1	22.184		27.12		57.421		45.93		31.899		53.27		4.160		74.53	
		79		199		45		99		185		264		58		144
15.1	22.105		25.13		57.376		44.94		31.714		50.63		4.102		73.09	
		32		225		11		102		121		299		14		169
25.1	22.073		22.88		57.387		43.92		31.593		47.64		4.088		71.40	
		19		252		71		99		53		325		34		188
Dec. 5.0	22.092		20.36		57.458		42.93		31.540		44.39		4.122		69.52	
		71		269		129		93		17		343		82		205
15.0	22.163		17.67		57.587		42.00		31.557		40.96		4.204		67.47	
		118		275		186		82		91		352		127		215
25.0	22.281		14.92		57.773		41.18		31.648		37.44		4.331		65.32	
		166		279		237		68		158		347		170		217
34.9	22.447		12.13		58.010		40.50		31.806		33.97		4.501		63.15	
Mean Place	20.598		23.59		54.161		36.78		32.038		47.19		2.073		72.90	
Sec δ, Tan δ	1.114		+0.491		1.253		−0.755		1.637		+1.296		1.025		+0.224	
$D_\psi \alpha$, $D_\omega \alpha$	+0.05		0.00		+0.08		−0.01		+0.03		+0.01		+0.06		0.00	
$D_\psi \delta$, $D_\omega \delta$	−0.1		−1.0		−0.1		−1.0		−0.1		−1.0		−0.1		−1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ξ Serpentis. Mag. 3.6				ι Herculis. Mag. 3.8				ω Draconis. Mag. 4.9				η Pavonis. Mag. 3.6			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	17 32		−15 20		17 37		+46 2		17 37		+68 47		17 37		−64 41	
	s		″		s		″		s		″		s		″	
Jan. 1.0	46.062	221	53.39	66	4.230	185	51.19	332	22.85	22	37.43	349	27.46	42	8.79	210
10.9	46.283	252	54.05	69	4.415	236	47.87	310	23.07	33	33.94	328	27.88	49	6.69	185
20.9	46.535	277	54.74	68	4.651	281	44.77	280	23.40	42	30.66	292	28.37	55	4.84	156
30.9	46.812	297	55.42	65	4.932	320	41.97	237	23.82	50	27.74	246	28.92	61	3.28	124
Feb. 9.8	47.109	309	56.07	56	5.252	347	39.60	184	24.32	58	25.28	191	29.53	65	2.04	91
19.8	47.418	316	56.63	46	5.599	364	37.76	128	24.90	61	23.37	129	30.18	66	1.13	55
29.8	47.734	317	57.09	30	5.963	374	36.48	65	25.51	64	22.08	63	30.84	68	0.58	20
Mar. 10.8	48.051	316	57.39	17	6.337	375	35.83	0	26.15	64	21.45	6	31.52	67	0.38	14
20.7	48.367	309	57.56	1	6.712	367	35.83	62	26.79	63	21.51	72	32.19	66	0.52	47
30.7	48.676	300	57.57	13	7.079	350	36.45	122	27.42	59	22.23	135	32.85	63	0.99	79
Apr. 9.7	48.976	287	57.44	27	7.429	327	37.67	176	28.01	55	23.58	194	33.48	61	1.78	109
19.7	49.263	270	57.17	37	7.756	296	39.43	224	28.56	48	25.52	243	34.09	58	2.87	135
29.6	49.533	250	56.80	45	8.052	261	41.67	263	29.04	39	27.95	282	34.67	52	4.22	161
May 9.6	49.783	225	56.35	49	8.313	219	44.30	291	29.43	31	30.77	315	35.19	46	5.83	182
19.6	50.008	197	55.86	52	8.532	173	47.21	312	29.74	20	33.92	334	35.65	39	7.65	199
29.5	50.205	165	55.34	52	8.705	125	50.33	321	29.94	12	37.26	344	36.04	32	9.64	213
June 8.5	50.370	130	54.82	50	8.830	72	53.54	322	30.06	1	40.70	344	36.36	24	11.77	221
18.5	50.500	92	54.32	45	8.902	19	56.76	315	30.07	9	44.14	336	36.60	15	13.98	222
28.5	50.592	50	53.87	41	8.921	35	59.91	297	29.98	21	47.50	319	36.75	5	16.20	219
July 8.4	50.642	10	53.46	36	8.886	87	62.88	275	29.77	28	50.69	292	36.80	3	18.39	207
18.4	50.652	31	53.10	31	8.799	136	65.63	244	29.49	38	53.61	260	36.77	12	20.46	192
28.4	50.621	69	52.79	27	8.663	184	68.07	210	29.11	46	56.21	223	36.65	21	22.38	166
Aug. 7.4	50.552	103	52.52	21	8.479	221	70.17	171	28.65	52	58.44	180	36.44	27	24.04	136
17.3	50.449	132	52.31	20	8.258	257	71.88	127	28.13	58	60.24	133	36.17	34	25.40	103
27.3	50.317	154	52.11	17	8.001	280	73.15	82	27.55	62	61.57	84	35.83	39	26.43	61
Sept. 6.3	50.163	168	51.94	16	7.721	295	73.97	36	26.93	64	62.41	33	35.44	41	27.04	18
16.2	49.995	170	51.78	13	7.426	300	74.33	15	26.29	65	62.74	20	35.03	43	27.22	28
26.2	49.825	163	51.65	12	7.126	294	74.18	63	25.64	64	62.54	73	34.60	41	26.94	73
Oct. 6.2	49.662	147	51.53	8	6.832	275	73.55	113	25.00	60	61.81	124	34.19	37	26.21	117
16.2	49.515	119	51.45	4	6.557	244	72.42	160	24.40	56	60.57	175	33.82	32	25.04	155
26.1	49.396	83	51.41	3	6.313	205	70.82	204	23.84	49	58.82	223	33.50	24	23.49	189
Nov. 5.1	49.313	41	51.44	11	6.108	157	68.78	245	23.35	41	56.59	265	33.26	16	21.60	217
15.1	49.272	6	51.55	21	5.951	101	66.33	280	22.94	32	53.94	302	33.10	6	19.43	236
25.1	49.278	55	51.76	31	5.850	39	63.53	308	22.62	20	50.92	330	33.04	6	17.07	245
Dec. 5.0	49.333	105	52.07	42	5.811	23	60.45	328	22.42	9	47.62	351	33.10	16	14.62	246
15.0	49.438	151	52.49	51	5.834	86	57.17	337	22.33	2	44.11	359	33.26	26	12.16	240
25.0	49.589	193	53.00	60	5.920	147	53.80	337	22.35	15	40.52	357	33.52	35	9.76	225
34.9	49.782		53.60		6.067		50.43		22.50		36.95		33.87		7.51	
Mean Place	46.509		47.56		5.633		61.81		26.494		48.67		29.038		7.02	
Sec δ, Tan δ	1.037		−0.274		1.441		+1.037		2.765		+2.577		2.339		−2.114	
$D_\psi \alpha$, $D_\omega \alpha$	+0.07		0.00		+0.03		+0.01		−0.01		+0.02		+0.11		−0.01	
$D_\psi \delta$, $D_\omega \delta$	0.0		−1.0		0.0		−1.0		0.0		−1.0		0.0		−1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	*β* Ophiuchi. Mag. 2.9				*ι*¹ Scorpii. Mag. 3.1				*μ* Herculis. Mag. 3.5				*ψ* Draconis. Mag. 4.9			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 17 39		° ′ + 4 35		h m 17 41		° ′ −40 5		h m 17 43		° ′ +27 45		h m 17 43		° ′ +72 10	
	s		″		s		″		s		″		s		″	
Jan. 1.0	18.826		57.81		41.930		47.87		9.379		59.45		21.20		74.75	
		193		174		261		86		177		281		21		350
10.9	19.019		56.07		42.191		47.01		9.556		56.64		21.41		71.25	
		226		167		303		70		216		265		34		330
20.9	19.245		54.40		42.494		46.31		9.772		53.99		21.75		67.95	
		253		155		336		57		250		242		46		296
30.9	19.498		52.85		42.830		45.74		10.022		51.57		22.21		64.99	
		272		135		363		41		275		208		58		252
Feb. 9.9	19.770		51.50		43.193		45.33		10.297		49.49		22.79		62.47	
		287		109		381		27		294		165		65		197
19.8	20.057		50.41		43.574		45.06		10.591		47.84		23.44		60.50	
		295		79		391		13		309		118		70		136
29.8	20.352		49.62		43.965		44.93		10.900		46.66		24.14		59.14	
		299		46		396		2		314		65		74		72
Mar. 10.8	20.651		49.16		44.361		44.91	—	11.214		46.01		24.88		58.42	
		298		10		395		10		315		11		75		2
20.7	20.949		49.06	—	44.756		45.01		11.529		45.90	—	25.63		58.40	—
		293		26		391		21		310		43		73		63
30.7	21.242		49.32		45.147		45.22		11.839		46.33		26.36		59.03	
		284		59		379		31		300		96		70		127
Apr. 9.7	21.526		49.91		45.526		45.53		12.139		47.29		27.06		60.30	
		272		88		364		41		284		140		64		186
19.7	21.798		50.79		45.890		45.94		12.423		48.69		27.70		62.16	
		255		115		344		51		263		182		55		235
29.6	22.053		51.94		46.234		46.45		12.686		50.51		28.25		64.51	
		236		136		319		60		240		216		46		277
May 9.6	22.289		53.30		46.553		47.05		12.926		52.67		28.71		67.28	
		211		150		289		71		210		240		36		309
19.6	22.500		54.80		46.842		47.76		13.136		55.07		29.07		70.37	
		184		161		254		79		177		259		25		330
29.6	22.684		56.41		47.096		48.55		13.313		57.66		29.32		73.67	
		152		166		214		86		141		266		12		342
June 8.5	22.836		58.07		47.310		49.41		13.454		60.32		29.44		77.09	
		118		163		169		92		100		269		1		343
18.5	22.954		59.70		47.479		50.33		13.554		63.01		29.45	—	80.52	
		81		159		120		96		59		261		12		336
28.5	23.035		61.29		47.599		51.29		13.613		65.62		29.33		83.88	
		41		150		70		97		15		249		24		319
July 8.4	23.076		62.79		47.669		52.26		13.628	—	68.11		29.09		87.07	
		4		137		17		94		27		230		35		295
18.4	23.080	—	64.16		47.686	—	53.20		13.601		70.41		28.74		90.02	
		37		121		34		88		70		205		46		263
28.4	23.043		65.37		47.652		54.08		13.531		72.46		28.28		92.65	
		73		106		83		78		109		178		54		227
Aug. 7.4	22.970		66.43		47.569		54.86		13.422		74.24		27.74		94.92	
		107		86		128		63		143		146		63		185
17.3	22.863		67.29		47.441		55.49		13.279		75.70		27.11		96.77	
		133		67		166		47		174		111		69		140
27.3	22.730		67.96		47.275		55.96		13.105		76.81		26.42		98.17	
		156		47		193		26		196		74		74		91
Sept. 6.3	22.574		68.43		47.082		56.22		12.909		77.55		25.68		99.08	
		169		26		213		5		211		36		77		40
16.3	22.405		68.69		46.869		56.27	—	12.698		77.91	—	24.91		99.48	—
		173		5		217		19		215		3		78		13
26.2	22.232		68.74	—	46.652		56.08		12.483		77.88		24.13		99.35	
		168		17		211		41		210		44		77		65
Oct. 6.2	22.064		68.57		46.441		55.67		12.273		77.44		23.36		98.70	
		151		39		192		64		195		84		74		118
16.2	21.913		68.18		46.249		55.03		12.078		76.60		22.62		97.52	
		128		61		160		83		171		123		69		168
26.1	21.785		67.57		46.089		54.20		11.907		75.37		21.93		95.84	
		96		83		116		98		138		160		61		215
Nov. 5.1	21.689		66.74		45.973		53.22		11.769		73.77		21.32		93.69	
		56		105		65		110		96		195		52		259
15.1	21.633		65.69		45.908		52.12		11.673		71.82		20.80		91.10	
		12		126		7		118		51		226		40		297
25.1	21.621	—	64.43		45.901	—	50.94		11.622		69.56		20.40		88.13	
		34		143		54		117		0		252		29		326
Dec. 5.0	21.655		63.00		45.955		49.77		11.622		67.04		20.11		84.87	
		81		157		116		114		51		270		15		349
15.0	21.736		61.43		46.071		48.63		11.673		64.34		19.96		81.38	
		126		169		174		107		100		281		1		357
25.0	21.862		59.74		46.245		47.56		11.773		61.53		19.95	—	77.81	
		167		173		229		96		147		283		13		357
35.0	22.029		58.01		46.474		46.60		11.920		58.70		20.08		74.24	
Mean Place	19.350		65.45		42.557		44.12		10.225		68.64		25.732		85.40	
Sec *δ*, Tan *δ*	1.003		+0.080		1.307		−0.842		1.130		+0.526		3.269		+3.112	
$D_\psi \alpha$, $D_\omega \alpha$	+0.06		0.00		+0.08		0.00		+0.05		0.00		−0.02		+0.01	
$D_\psi \delta$, $D_\omega \delta$	0.0		−1.0		0.0		−1.0		0.0		−1.0		0.0		−1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Ophiuchi. Mag. 3.7				89 Herculis. Mag. 5.5				ξ Draconis. Mag. 3.9				35 Draconis. Mag. 5.0			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	17 43		+ 2 44		17 52		+26 3		17 52		+56 52		17 53		+76 58	
	s		″		s		″		s		″		s		″	
Jan. 1.0	40.288		9.51		1.059		36.89		2.497		58.24		5.88		19.47	
10.9	40.478	190	7.88	163	1.227	168	34.18	271	2.664	167	54.76	348	6.09	21	16.01	346
20.9	40.702	224	6.30	158	1.435	208	31.61	257	2.902	238	51.46	330	6.47	38	12.73	328
30.9	40.953	251	4.84	146	1.676	241	29.26	235	3.202	300	48.47	299	7.02	55	9.76	297
Feb. 9.9	41.223	270	3.55	129	1.945	269	27.22	204	3.557	355	45.91	256	7.73	71	7.20	256
19.8	41.508	285	2.51	104	2.233	288	25.59	163	3.954	397	43.85	206	8.55	82	5.16	204
29.8	41.803	295	1.76	75	2.536	303	24.42	117	4.381	427	42.40	145	9.47	92	3.72	144
Mar. 10.8	42.101	298	1.32	44	2.846	310	23.76	66	4.829	448	41.59	81	10.43	96	2.91	81
20.7	42.400	299	1.21	11 —	3.159	313	23.62	14 —	5.282	453	41.44	15 —	11.42	99	2.77	14 —
30.7	42.694	294	1.44	23	3.468	309	24.01	39	5.728	446	41.97	53	12.40	98	3.31	54
Apr. 9.7	42.980	286	1.98	54	3.768	300	24.91	90	6.160	432	43.12	115	13.33	93	4.47	116
19.7	43.254	274	2.82	84	4.055	287	26.27	136	6.562	402	44.86	174	14.19	86	6.21	174
29.6	43.512	258	3.91	109	4.324	269	28.04	177	6.927	365	47.12	226	14.95	76	8.47	226
May 9.6	43.751	239	5.18	127	4.569	245	30.15	211	7.246	319	49.81	269	15.57	62	11.16	269
19.6	43.966	215	6.60	142	4.787	218	32.51	236	7.512	266	52.83	302	16.06	49	14.18	302
29.6	44.155	189	8.12	152	4.974	187	35.06	255	7.719	207	56.08	325	16.38	32	17.43	325
June 8.5	44.313	158	9.69	157	5.125	151	37.70	264	7.863	144	59.47	339	16.55	17	20.82	339
18.5	44.436	123	11.24	155	5.237	112	40.36	266	7.940	77	62.90	343	16.55	0	24.25	343
28.5	44.522	86	12.75	151	5.307	70	42.96	260	7.947	7 —	66.27	337	16.39	16	27.63	338
July 8.4	44.571	49	14.16	141	5.334	27 —	45.45	249	7.887	60	69.50	323	16.05	34	30.86	323
18.4	44.579	8 —	15.45	129	5.319	15	47.77	232	7.760	127	72.51	301	15.57	48	33.86	300
28.4	44.548	31	16.60	115	5.261	58	49.86	209	7.570	190	75.22	271	14.95	62	36.58	272
Aug. 7.4	44.479	69	17.59	99	5.165	96	51.68	182	7.322	248	77.60	238	14.19	76	38.96	238
17.3	44.378	101	18.41	82	5.031	134	53.18	150	7.023	299	79.57	197	13.33	86	40.93	197
27.3	44.246	132	19.04	63	4.866	165	54.35	117	6.681	342	81.10	153	12.38	95	42.46	153
Sept. 6.3	44.094	152	19.49	45	4.679	187	55.17	82	6.307	374	82.15	105	11.35	103	43.52	106
16.3	43.927	167	19.74	25	4.476	203	55.62	45	5.910	397	82.70	55	10.29	106	44.08	56
26.2	43.755	172	19.80	6 —	4.266	210	55.68	6 —	5.506	404	82.74	4 —	9.20	109	44.12	4 —
Oct. 6.2	43.589	166	19.65	15	4.059	207	55.35	33	5.107	399	82.24	50	8.13	107	43.64	48
16.2	43.436	153	19.31	34	3.866	193	54.63	72	4.725	382	81.24	100	7.09	104	42.64	100
26.1	43.308	128	18.77	54	3.696	170	53.53	110	4.375	350	79.72	152	6.11	98	41.13	151
Nov. 5.1	43.210	98	18.01	76	3.557	139	52.07	146	4.068	307	77.73	199	5.22	89	39.15	198
15.1	43.152	58	17.05	96	3.458	99	50.25	182	3.817	251	75.28	245	4.45	77	36.71	244
25.1	43.138	14 —	15.89	116	3.403	55	48.12	213	3.631	186	72.46	282	3.83	62	33.91	280
Dec. 5.0	43.169	31	14.58	131	3.397	6 —	45.75	237	3.516	115	69.31	315	3.36	47	30.77	314
15.0	43.248	79	13.12	146	3.441	44	43.17	258	3.479	37 —	65.93	338	3.08	28	27.41	336
25.0	43.372	124	11.55	157	3.535	94	40.48	269	3.521	42	62.41	352	2.98	10 —	23.91	350
35.0	43.537	165	9.94	161	3.674	139	37.76	272	3.640	119	58.90	351	3.06	8	20.41	350
Mean Place	40.805		16.87		1.889		45.44		4.646		67.86		12.489		29.06	
Sec δ, Tan δ	1.001		+0.048		1.113		+0.489		1.830		+1.533		4.436		+4.322	
D$_\psi$ α, D$_\omega$ α	+0.06		0.00		+0.05		0.00		+0.02		0.00		−0.05		+0.01	
D$_\psi$ δ, D$_\omega$ δ	0.0		−1.0		0.0		−1.0		0.0		−1.0		0.0		−1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	θ Herculis. Mag. 4.0				ν Ophiuchi. Mag. 3.5				ξ Herculis. Mag. 3.8				γ Draconis. Mag. 2.4			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	17 53		+37 15		17 54		− 9 45		17 54		+29 14		17 54		+51 29	
	s		″		s		″		s		″		s		″	
Jan. 1.0	21.202	163	30.53	309	23.620	192	57.58	89	29.142	165	73.85	283	37.560	162	44.58	342
10.9	21.365	210	27.44	294	23.812	227	58.47	89	29.307	207	71.02	269	37.722	221	41.16	324
20.9	21.575	248	24.50	267	24.039	254	59.36	84	29.514	240	68.33	245	37.943	276	37.92	295
30.9	21.823	282	21.83	231	24.293	275	60.20	76	29.754	269	65.88	212	38.219	323	34.97	254
Feb. 9.9	22.105	308	19.52	186	24.568	290	60.96	62	30.023	291	63.76	171	38.542	359	32.43	204
19.8	22.413	324	17.66	132	24.858	301	61.58	46	30.314	307	62.05	123	38.901	385	30.39	145
29.8	22.737	335	16.34	76	25.159	307	62.04	26	30.621	316	60.82	70	39.286	402	28.94	84
Mar. 10.8	23.072	339	15.58	15	25.466	307	62.30	7	30.937	318	60.12	16	39.688	408	28.10	17
20.8	23.411	335	15.43	—45	25.773	304	62.37	—17	31.255	315	59.96	—40	40.096	402	27.93	—49
30.7	23.746	326	15.88	101	26.077	299	62.20	35	31.570	306	60.36	92	40.498	390	28.42	110
Apr. 9.7	24.072	308	16.89	155	26.376	289	61.85	53	31.876	293	61.28	140	40.888	367	29.52	168
19.7	24.380	287	18.44	200	26.665	275	61.32	69	32.169	275	62.68	183	41.255	335	31.20	219
29.6	24.667	259	20.44	237	26.940	257	60.63	79	32.444	249	64.51	219	41.590	297	33.39	261
May 9.6	24.926	226	22.81	269	27.197	236	59.84	87	32.693	221	66.70	245	41.887	252	36.00	296
19.6	25.152	190	25.50	289	27.433	209	58.97	92	32.914	189	69.15	266	42.139	202	38.96	318
29.6	25.342	148	28.39	301	27.642	178	58.05	91	33.103	152	71.81	276	42.341	147	42.14	331
June 8.5	25.490	103	31.40	304	27.820	145	57.14	89	33.255	112	74.57	278	42.488	88	45.45	337
18.5	25.593	56	34.44	300	27.965	107	56.25	84	33.367	69	77.35	275	42.576	28	48.82	331
28.5	25.649	8	37.44	286	28.072	67	55.41	77	33.436	25	80.10	261	42.604	—31	52.13	318
July 8.4	25.657	—39	40.30	267	28.139	25	54.64	68	33.461	—19	82.71	243	42.573	92	55.31	296
18.4	25.618	85	42.97	241	28.164	—16	53.96	60	33.442	62	85.14	220	42.481	148	58.27	268
28.4	25.533	130	45.38	210	28.148	55	53.36	50	33.380	104	87.34	193	42.333	201	60.95	235
Aug. 7.4	25.403	168	47.48	175	28.093	90	52.86	41	33.276	139	89.27	159	42.132	247	63.30	196
17.3	25.235	202	49.23	136	28.003	122	52.45	33	33.137	172	90.86	125	41.885	286	65.26	153
27.3	25.033	226	50.59	96	27.881	146	62.12	23	32.965	196	92.11	88	41.599	317	66.79	106
Sept. 6.3	24.807	243	51.55	52	27.735	163	51.89	16	32.769	212	92.99	49	41.282	336	67.85	57
16.3	24.564	250	52.07	6	27.572	169	51.73	9	32.557	219	93.48	8	40.946	345	68.42	8
26.2	24.314	248	52.13	—39	27.403	166	51.64	1	32.338	217	93.56	—33	40.601	342	68.50	—43
Oct. 6.2	24.066	233	51.74	84	27.237	153	51.63	—7	32.121	202	93.23	74	40.259	326	68.07	96
16.2	23.833	209	50.90	129	27.084	129	51.70	15	31.919	181	92.49	115	39.933	298	67.11	145
26.1	23.624	175	49.61	172	26.955	99	51.85	27	31.738	148	91.34	154	39.635	258	65.66	192
Nov. 5.1	23.449	133	47.39	211	26.856	58	52.12	37	31.590	109	89.80	188	39.377	209	63.74	235
15.1	23.316	85	45.78	247	26.798	15	52.49	48	31.481	64	87.92	222	39.168	151	61.39	275
25.1	23.231	32	43.31	274	26.783	—31	52.97	59	31.417	15	85.70	249	39.017	86	58.64	306
Dec. 5.0	23.199	—23	40.57	297	26.814	79	53.56	71	31.402	—37	83.21	268	38.931	19	55.58	330
15.0	23.222	78	37.60	310	26.893	125	54.27	79	31.439	88	80.53	281	38.912	—52	52.28	343
25.0	23.300	131	34.50	312	27.018	167	55.06	85	31.527	135	77.72	284	38.964	118	48.85	345
35.0	23.431		31.38		27.185		55.91		31.662		74.88		39.082		45.40	
Mean Place	22.320		39.49		24.092		51.32		30.046		82.39		39.325		53.85	
Sec δ, Tan δ	1.257		+0.761		1.015		−0.172		1.146		+0.560		1.606		+1.257	
$D_\psi \alpha$, $D_\omega \alpha$	+0.04		0.00		+0.07		0.00		+0.05		0.00		+0.03		0.00	
$D_\psi \delta$, $D_\omega \delta$	0.0		−1.0		0.0		−1.0		0.0		−1.0		0.0		−1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	67 Ophiuchi. Mag. 3.9				θ Aræ. Mag. 3.9				γ Sagittarii. Mag. 3.1				70 Ophiuchi. Mag. 4.1			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	17 56		+ 2 55		18 0		−50 5		18 0		−30 25		18 1		+ 2 30	
	s		″		s		″		s		″		s		″	
Jan. 1.0	25.762		57.95		4.653		58.53		24.106		39.35		11.991		58.01	
10.9	25.941	179	56.35	160	4.926	273	57.00	153	24.323	217	38.96	39	12.166	175	56.42	159
20.9	26.154	213	54.79	156	5.252	326	55.61	139	24.579	256	38.65	31	12.375	209	54.87	155
30.9	26.394	240	53.34	145	5.622	370	54.41	120	24.866	287	38.42	23	12.614	239	53.43	144
Feb. 9.9	26.657	263	52.09	125	6.027	405	53.41	100	25.179	313	38.24	18	12.874	260	52.16	127
		279		103		431		79		330		12		277		103
19.8	26.936		51.06		6.458		52.62		25.509		38.12		13.151		51.13	
29.8	27.226	290	50.32	74	6.907	449	52.03	59	25.851	342	38.02	10	13.439	288	50.37	76
Mar. 10.8	27.522	296	49.89	43	7.367	460	51.66	37	26.202	351	37.94	8	13.734	295	49.92	45
20.8	27.820	298	49.80	9 —	7.829	462	51.51	15 —	26.555	353	37.87	7	14.033	299	49.81	11 —
30.7	28.116	296	50.05	25	8.290	461	51.55	4	26.904	349	37.80	7	14.329	296	50.03	22
		290		58		452		26		345		5		293		54
Apr. 9.7	28.406		50.63		8.742		51.81		27.249		37.75		14.622		50.57	
19.7	28.686	280	51.48	85	9.180	438	52.25	44	27.584	335	37.72	3	14.903	281	51.40	83
29.6	28.952	266	52.60	112	9.597	417	52.89	64	27.904	320	37.72	0	15.172	269	52.48	108
May 9.6	29.200	248	53.92	132	9.988	391	53.72	83	28.205	301	37.76	4	15.425	253	53.76	128
19.6	29.426	226	55.38	146	10.342	354	54.73	101	28.483	278	37.86	10	15.654	229	55.19	143
		199		157		316		115		247		16		203		153
29.6	29.625		56.95		10.658		55.88		28.730		38.02		15.857		56.72	
June 8.5	29.793	168	58.56	161	10.925	267	57.17	129	28.942	212	38.26	24	16.032	175	58.30	158
18.5	29.929	136	60.16	160	11.139	214	58.57	140	29.116	174	38.55	29	16.173	141	59.86	156
28.5	30.027	98	61.71	155	11.297	158	60.04	147	29.247	131	38.91	36	16.275	102	61.37	151
July 8.5	30.085	58	63.18	147	11.393	96	61.54	150	29.333	86	39.32	41	16.339	64	62.80	143
		18 —		135		33 —		148		38 —		43		24 —		130
18.4	30.103		64.53		11.426		63.02		29.371		39.75		16.363		64.10	
28.4	30.081	22	65.72	119	11.395	31	64.40	138	29.361	10	40.20	45	16.344	19	65.27	117
Aug. 7.4	30.020	61	66.76	104	11.306	89	65.67	127	29.305	56	40.63	43	16.288	56	66.28	101
17.3	29.927	93	67.62	86	11.161	145	66.77	110	29.207	98	41.01	38	16.195	93	67.11	83
27.3	29.801	126	68.29	67	10.967	194	67.65	88	29.073	134	41.31	30	16.074	121	67.76	65
		149		49		231		58		164		20		147		46
Sept. 6.3	29.652		68.78		10.736		68.23		28.909		41.51		15.927		68.22	
16.3	29.486	166	69.07	29	10.480	256	68.53	30 —	28.727	182	41.59	8 —	15.762	165	68.49	27
26.2	29.314	172	69.17	10 —	10.211	269	68.50	3	28.535	192	41.55	4	15.591	171	68.56	7 —
Oct. 6.2	29.145	169	69.07	10	9.946	265	68.16	34	28.346	189	41.36	19	15.423	168	68.43	13
16.2	28.988	157	68.75	32	9.701	245	67.47	69	28.171	175	41.05	31	15.267	156	68.11	32
		135		51		212		98		150		43		139		53
26.2	28.853		68.24		9.489		66.49		28.021		40.62		15.128		67.58	
Nov. 5.1	28.748	105	67.51	73	9.322	167	65.24	125	27.907	114	40.09	53	15.021	107	66.86	72
15.1	28.681	67	66.59	92	9.214	108	63.78	146	27.837	70	39.51	58	14.951	70	65.94	92
25.1	28.656	25 —	65.46	113	9.168	46 —	62.16	162	27.817	20 —	38.89	62	14.923	28 —	64.82	112
Dec. 5.0	28.676	20	64.18	128	9.195	27	60.43	173	27.849	32	38.27	62	14.941	18	63.55	127
		67		143		98		174		87		58		64		142
15.0	28.743		62.75		9.293		58.69		27.936		37.69		15.005		62.13	
25.0	28.854	111	61.22	153	9.460	167	56.98	171	28.074	138	37.17	52	15.113	108	60.60	153
35.0	29.007	153	59.63	159	9.693	233	55.35	163	28.261	187	36.72	45	15.261	148	59.03	157
Mean Place	26.297		64.98		5.496		54.75		24.630		34.40		12.528		64.89	
Sec δ, Tan δ	1.001		+0.051		1.559		−1.196		1.160		−0.587		1.001		+0.044	
$D_\psi \alpha$, $D_\omega \alpha$	+0.06		0.00		+0.09		0.00		+0.08		0.00		+0.06		0.00	
$D_\psi \delta$, $D_\omega \delta$	0.0		−1.0		0.0		−1.0		0.0		−1.0		0.0		−1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	72 Ophiuchi. Mag. 3.7				o Herculis. Mag. 3.8				μ Sagittarii. Mag. 4.0				η Sagittarii. Mag. 3.2			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 18 3 s		° ′ + 9 32 ″		h m 18 4 s		° ′ +28 44 ″		h m 18 8 s		° ′ −21 4 ″		h m 18 11 s		° ′ −36 47 ″	
Jan. 1.0	21.402		56.86		15.007		52.69		43.877		60.20		56.053		20.94	
11.0	21.570	168	54.93	193	15.162	155	49.89	280	44.070	193	60.33	13	56.271	218	20.10	84
20.9	21.773	203	53.06	187	15.358	196	47.21	268	44.299	229	60.51	18	56.530	259	19.35	75
30.9	22.004	231	51.35	171	15.589	231	44.75	246	44.558	259	60.70	19	56.825	295	18.70	65
Feb. 9.9	22.259	255	49.84	151	15.850	261	42.61	214	44.841	283	60.88	18	57.148	323	18.14	56
19.8	22.532	273	48.62	122	16.134	284	40.87	174	45.143	302	61.02	14	57.495	347	17.67	47
29.8	22.818	286	47.73	89	16.436	302	39.61	126	45.457	314	61.10	8	57.855	360	17.29	38
Mar. 10.8	23.112	294	47.22	51	16.747	311	38.86	75	45.778	321	61.10	0	58.226	371	16.98	31
20.8	23.409	297	47.11	11	17.064	317	38.65	21	46.104	326	61.01	9	58.602	376	16.77	21
30.7	23.705	296	47.40	29	17.379	315	39.00	35	46.429	325	60.83	18	58.979	377	16.61	16
Apr. 9.7	23.996	291	48.07	67	17.687	308	39.87	87	46.750	321	60.55	28	59.351	372	16.54	7
19.7	24.278	282	49.08	101	17.985	298	41.22	135	47.064	314	60.22	33	59.713	362	16.55	1
29.7	24.546	268	50.40	132	18.265	280	43.01	179	47.364	300	59.84	38	60.061	348	16.65	10
May 9.6	24.796	250	51.98	158	18.522	257	45.17	216	47.648	284	59.43	41	60.391	330	16.86	21
19.6	25.024	228	53.74	176	18.752	230	47.59	242	47.911	263	59.02	41	60.695	304	17.17	31
29.6	25.225	201	55.63	189	18.950	198	50.23	264	48.148	237	58.63	39	60.968	273	17.58	41
June 8.5	25.395	170	57.59	196	19.112	162	52.98	275	48.353	205	58.29	34	61.207	239	18.10	52
18.5	25.531	136	59.55	196	19.234	122	55.77	279	48.522	169	58.00	29	61.404	197	18.71	61
28.5	25.629	98	61.47	192	19.314	80	58.53	276	48.653	131	57.78	22	61.556	152	19.41	70
July 8.5	25.687	58	63.30	183	19.349	35	61.16	263	48.740	87	57.63	15	61.658	102	20.15	74
18.4	25.705	18	64.98	168	19.340	9	63.64	248	48.784	44	57.54	9	61.708	50	20.93	78
28.4	25.681	24	66.50	152	19.287	53	65.89	225	48.783	1	57.50	4	61.706	2	21.71	78
Aug. 7.4	25.619	62	67.83	133	19.193	94	67.87	198	48.739	44	57.50	0	61.654	52	22.46	75
17.4	25.522	97	68.95	112	19.060	133	69.53	166	48.655	84	57.53	3	61.556	98	23.11	65
27.3	25.392	130	69.83	88	18.894	166	70.86	133	48.535	120	57.56	3	61.417	139	23.67	56
Sept. 6.3	25.239	153	70.46	63	18.703	191	71.82	96	48.389	146	57.59	3	61.245	172	24.09	42
16.3	25.068	171	70.85	39	18.493	210	72.38	56	48.222	167	57.59	0	61.050	195	24.32	23
26.2	24.891	177	70.97	12	18.276	217	72.55	17	48.045	177	57.55	4	60.843	207	24.37	5
Oct. 6.2	24.716	175	70.84	13	18.061	215	72.32	23	47.869	176	57.47	8	60.635	208	24.21	16
16.2	24.549	167	70.45	39	17.856	205	71.67	65	47.706	163	57.36	11	60.440	195	23.86	35
26.2	24.404	145	69.78	67	17.672	184	70.62	105	47.565	141	57.22	14	60.270	170	23.33	53
Nov. 5.1	24.289	115	68.87	91	17.519	153	69.19	143	47.455	110	57.06	16	60.136	134	22.62	71
15.1	24.210	79	67.70	117	17.404	115	67.39	180	47.385	70	56.91	15	60.047	89	21.79	83
25.1	24.173	37	66.32	138	17.333	71	65.25	214	47.359	26	56.79	12	60.009	38	20.86	93
Dec. 5.1	24.180	7	64.71	161	17.310	23	62.85	240	47.382	23	56.71	8	60.028	19	19.89	97
15.0	24.234	54	62.95	176	17.337	27	60.22	263	47.455	73	56.68	3	60.103	75	18.90	99
25.0	24.332	98	61.08	187	17.414	77	57.46	276	47.575	120	56.71	3	60.235	132	17.94	96
35.0	24.472	140	59.16	192	17.539	125	54.66	280	47.740	165	56.80	9	60.419	184	17.05	89
Mean Place	22.004		64.03		15.919		60.57		44.356		54.61		56.636		16.04	
Sec δ, Tan δ	1.014		+0.168		1.141		+0.549		1.071		−0.386		1.248		−0.748	
$D_\psi \alpha$, $D_\omega \alpha$	+0.06		0.00		+0.05		0.00		+0.07		0.00		+0.08		0.00	
$D_\psi \delta$, $D_\omega \delta$	0.0		−1.0		0.0		−1.0		0.0		−1.0		0.0		−1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	**Groombridge 2533.** Mag. 5.4				**36 Draconis.** Mag. 5.0				**δ Sagittarii.** Mag. 2.8				**η Serpentis.** Mag. 3.4			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	18 13		+42 7		18 13		+64 21		18 15		−29 51		18 16		− 2 55	
	s		″		s		″		s		″		s		″	
Jan. 1.0	0.644		40.88		21.72		59.59		36.465		58.95		57.232		23.52	
11.0	0.781	137	37.68	320	21.84	12	56.07	352	36.664	199	58.52	43	57.396	164	24.74	122
20.9	0.970	189	34.60	308	22.06	22	52.67	340	36.902	238	58.14	38	57.595	199	25.93	119
30.9	1.204	234	31.75	285	22.37	31	49.55	312	37.174	272	57.82	32	57.822	227	27.05	112
Feb. 9.9	1.478	274	29.26	249	22.76	39	46.80	275	37.474	300	57.54	28	58.074	252	28.03	98
19.8	1.783	305	27.22	204	23.20	44	44.53	227	37.792	318	57.30	24	58.343	269	28.83	80
29.8	2.112	329	25.70	152	23.70	50	42.83	170	38.126	334	57.08	22	58.627	284	29.40	57
Mar. 10.8	2.457	345	24.77	93	24.23	53	41.77	106	38.469	343	56.86	22	58.919	292	29.71	31
20.8	2.812	355	24.44	33	24.78	55	41.37	40	38.818	349	56.64	22	59.217	298	29.75	4
30.7	3.166	354	24.73	29	25.33	55	41.64	27	39.167	349	56.43	21	59.516	299	29.50	25
Apr. 9.7	3.514	348	25.62	89	25.86	53	42.58	94	39.514	347	56.23	20	59.812	296	28.99	51
19.7	3.849	335	27.09	147	26.37	51	44.12	154	39.853	339	56.05	18	60.101	289	28.23	76
29.7	4.162	313	29.05	196	26.84	47	46.21	209	40.179	326	55.90	15	60.380	279	27.27	96
May 9.6	4.448	286	31.42	237	27.25	41	48.77	256	40.488	309	55.79	11	60.643	263	26.13	114
19.6	4.700	252	34.15	273	27.58	33	51.72	295	40.775	287	55.74	5	60.888	245	24.88	125
29.6	4.914	214	37.13	298	27.85	27	54.94	322	41.034	259	55.77	3	61.107	219	23.55	133
June 8.5	5.084	170	40.27	314	28.05	20	58.35	341	41.260	226	55.88	11	61.298	191	22.20	135
18.5	5.206	122	43.48	321	28.16	11	61.85	350	41.450	190	56.07	19	61.455	157	20.87	133
28.5	5.279	73	46.67	319	28.18	2	65.34	349	41.596	146	56.35	28	61.575	120	19.58	129
July 8.5	5.299	20	49.76	309	28.11	7	68.74	340	41.697	101	56.69	34	61.656	81	18.40	118
18.4	5.267	32	52.67	291	27.95	16	71.96	322	41.750	53	57.08	39	61.695	39	17.31	109
28.4	5.185	82	55.34	267	27.72	23	74.91	295	41.755	5	57.50	42	61.694	1	16.34	97
Aug. 7.4	5.054	131	57.72	238	27.41	31	77.55	264	41.713	42	57.92	42	61.651	43	15.52	82
17.4	4.880	174	59.75	203	27.04	37	79.81	226	41.628	85	58.32	40	61.570	81	14.85	67
27.3	4.668	212	61.38	163	26.61	43	81.64	183	41.504	124	58.67	35	61.457	113	14.31	54
Sept. 6.3	4.427	241	62.59	121	26.13	48	83.01	137	41.348	156	58.93	26	61.317	140	13.93	38
16.3	4.163	264	63.35	76	25.62	51	83.88	87	41.171	177	59.09	16	61.157	160	13.70	23
26.2	3.889	274	63.65	30	25.09	53	84.24	36	40.982	189	59.13	4	60.988	169	13.60	10
Oct. 6.2	3.614	275	63.47	18	24.56	53	84.06	18	40.792	190	59.04	9	60.818	170	13.65	5
16.2	3.351	263	62.80	67	24.05	51	83.35	71	40.612	180	58.81	23	60.658	160	13.85	20
26.2	3.107	244	61.66	114	23.57	48	82.11	124	40.456	156	58.47	34	60.517	141	14.20	35
Nov. 5.1	2.896	211	60.06	160	23.13	44	80.36	175	40.333	123	58.02	45	60.403	114	14.68	48
15.1	2.726	170	58.03	203	22.75	38	78.14	222	40.250	83	57.50	52	60.324	79	15.34	66
25.1	2.603	123	55.63	240	22.44	31	75.48	266	40.215	35	56.93	57	60.286	38	16.13	79
Dec. 5.1	2.534	69	52.88	275	22.22	22	72.46	302	40.232	17	56.34	59	60.293	7	17.06	93
15.0	2.522	12	49.88	300	22.10	12	69.17	329	40.301	69	55.77	57	60.344	51	18.12	106
25.0	2.569	47	46.72	316	22.07	3	65.69	348	40.422	121	55.23	54	60.438	94	19.27	115
35.0	2.671	102	43.51	321	22.13	6	62.15	354	40.591	169	54.74	49	60.576	138	20.47	120
Mean Place	1.984		48.39		24.805		67.11		36.982		53.67		57.745		17.24	
Sec δ, Tan δ	1.348		+0.904		2.312		+2.084		1.153		−0.574		1.001		−0.051	
$D_\psi \alpha$, $D_\omega \alpha$	+0.04		0.00		+0.01		−0.01		+0.08		0.00		+0.06		0.00	
$D_\psi \delta$, $D_\omega \delta$	0.0		−1.0		0.0		−1.0		0.0		−1.0		0.0		−1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ε Sagittarii. Mag. 2.0				109 Herculis. Mag. 3.9				α Telescopii. Mag. 3.8				χ Draconis. Mag. 3.7			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 18 18 s		° ′ −34 25 ″		h m 18 20 s		° ′ +21 43 ″		h m 18 20 s		° ′ −46 0 ″		h m 18 22 s		° ′ +72 41 ″	
Jan. 1.0	35.219		36.23		6.294		43.34		43.988		62.26		29.43		41.38	
11.0	35.424	205	35.51	72	6.436	142	40.85	249	44.217	229	60.83	143	29.53	10	37.86	352
20.9	35.670	246	34.85	66	6.618	182	38.45	240	44.497	280	59.50	133	29.77	24	34.44	342
30.9	35.951	281	34.27	58	6.834	216	36.23	222	44.821	324	58.31	119	30.13	36	31.26	318
Feb. 9.9	36.262	311	33.76	51	7.078	244	34.26	197	45.179	358	57.25	106	30.62	49	28.42	284
19.9	36.593	331	33.31	45	7.346	268	32.65	161	45.563	384	56.35	90	31.20	58	26.07	235
29.8	36.942	349	32.93	38	7.630	284	31.45	120	45.970	407	55.62	73	31.88	68	24.25	182
Mar. 10.8	37.300	358	32.60	33	7.927	297	30.72	73	46.389	419	55.04	58	32.61	73	23.05	120
20.8	37.665	365	32.31	29	8.232	305	30.47	25	46.815	426	54.63	41	33.37	76	22.53	52
30.7	38.031	366	32.09	22	8.537	305	30.73	26	47.244	429	54.41	22	34.14	77	22.66	13
Apr. 9.7	38.395	364	31.92	17	8.839	302	31.47	74	47.670	426	54.34	7	34.89	75	23.45	79
19.7	38.750	355	31.80	12	9.134	295	32.66	119	48.087	417	54.44	10	35.61	72	24.88	143
29.7	39.094	344	31.76	4	9.416	282	34.25	159	48.488	401	54.73	29	36.25	64	26.85	197
May 9.6	39.420	326	31.81	5	9.679	263	36.17	192	48.869	381	55.18	45	36.83	58	29.31	246
19.6	39.722	302	31.95	14	9.920	241	38.37	220	49.221	352	55.82	64	37.30	47	32.15	284
29.6	39.996	274	32.20	25	10.132	212	40.75	238	49.539	318	56.61	79	37.67	37	35.32	317
June 8.6	40.235	239	32.55	35	10.312	180	43.25	250	49.816	277	57.56	95	37.91	24	38.68	336
18.5	40.435	200	32.99	44	10.456	144	45.80	255	50.045	229	58.63	107	38.04	13	42.16	348
28.5	40.590	155	33.52	53	10.560	104	48.32	252	50.221	176	59.82	119	38.04	0	45.65	349
July 8.5	40.697	107	34.12	60	10.621	61	50.75	243	50.341	120	61.06	124	37.92	12	49.06	341
18.4	40.754	57	34.77	65	10.638	17	53.04	229	50.403	62	62.34	128	37.66	26	52.32	326
28.4	40.760	6	35.44	67	10.613	25	55.12	208	50.403	0	63.59	125	37.29	37	55.34	302
Aug. 7.4	40.717	43	36.09	65	10.546	67	56.97	185	50.345	58	64.76	117	36.82	47	58.06	272
17.4	40.628	89	36.69	60	10.440	106	58.55	158	50.234	111	65.83	107	36.25	57	60.43	237
27.3	40.497	131	37.20	51	10.302	138	59.82	127	50.074	160	66.73	90	35.60	65	62.38	195
Sept. 6.3	40.333	164	37.60	40	10.135	167	60.78	96	49.875	199	67.41	68	34.88	72	63.88	150
16.3	40.146	187	37.84	24	9.949	186	61.40	62	49.648	227	67.85	44	34.12	76	64.90	102
26.3	39.947	199	37.92	8	9.752	197	61.66	26	49.405	243	68.01	16	33.32	80	65.39	49
Oct. 6.2	39.745	202	37.83	9	9.554	198	61.57	9	49.160	245	67.87	14	32.52	80	65.36	3
16.2	39.555	190	37.55	28	9.365	189	61.12	45	48.927	233	67.45	42	31.73	79	64.80	56
26.2	39.387	168	37.11	44	9.194	171	60.31	81	48.720	207	66.74	71	30.98	75	63.71	109
Nov. 5.1	39.255	132	36.52	59	9.049	145	59.15	116	48.552	168	65.78	96	30.28	70	62.10	161
15.1	39.164	91	35.81	71	8.940	109	57.65	150	48.433	119	64.59	119	29.67	61	60.01	209
25.1	39.123	41	35.02	79	8.872	68	55.85	180	48.372	61	63.24	135	29.15	52	57.47	254
Dec. 5.1	39.135	12	34.18	84	8.848	24	53.78	207	48.375	3	61.78	146	28.75	40	54.55	292
15.0	39.203	68	33.34	84	8.871	23	51.52	226	48.441	66	60.25	153	28.49	26	51.34	321
25.0	39.325	122	32.51	83	8.940	69	49.10	242	48.572	131	58.72	153	28.35	14	47.91	343
35.0	39.497	172	31.73	78	9.055	115	46.63	247	48.763	191	57.24	148	28.35	0	44.40	351
Mean Place	35.774		31.06		7.085		50.07		44.715		57.43		34.431		47.81	
Sec δ, Tan δ	1.212		−0.685		1.076		+0.399		1.440		−1.036		3.362		+3.209	
$D_\psi \alpha$, $D_\omega \alpha$	+0.08		0.00		+0.05		0.00		+0.09		+0.01		−0.02		−0.02	
$D_\psi \delta$, $D_\omega \delta$	0.0		−1.0		0.0		−1.0		0.0		−1.0		0.0		−1.0	

Washington Mean Time.	**λ Sagittarii.** Mag. 2.9				**c Serpentis.** Mag. 5.4				**1 Aquilæ.** Mag. 4.1				**ζ Pavonis.** Mag. 4.1			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	18 22		−25 28		18 25		− 2 2		18 30		− 8 18		18 33		−71 29	
	s		″		s		″		s		″		s		″	
Jan. 1.0	46.717		14.99		18.152		32.05		37.662		19.33		11.16		71.62	
11.0	46.901	184	14.80	19	18.307	155	33.29	124	37.818	156	20.18	85	11.53	37	68.85	277
20.9	47.124	223	14.64	16	18.499	192	34.49	120	38.011	193	21.02	84	12.01	48	66.23	262
30.9	47.379	255	14.51	13	18.720	221	35.61	112	38.233	222	21.79	77	12.59	58	63.80	243
Feb. 9.9	47.660	281	14.39	12	18.967	247	36.59	98	38.480	247	22.47	68	13.27	68	61.64	216
19.9	47.963	303	14.27	12	19.231	264	37.39	80	38.747	267	23.01	54	14.02	75	59.78	186
29.8	48.280	317	14.12	15	19.512	281	37.94	55	39.031	284	23.36	35	14.82	80	58.26	152
Mar. 10.8	48.608	328	13.93	19	19.802	290	38.23	29	39.324	293	23.48	12 —	15.66	84	57.11	115
20.8	48.941	333	13.69	24	20.097	295	38.23	0	39.626	302	23.40	8	16.54	88	56.34	77
30.7	49.277	336	13.41	28	20.397	300	37.96	27	39.931	305	23.10	30	17.41	87	55.95	39
Apr. 9.7	49.612	335	13.10	31	20.695	298	37.39	57	40.235	304	22.59	51	18.28	87	55.94	1 —
19.7	49.940	328	12.77	33	20.988	293	36.58	81	40.536	301	21.86	73	19.15	87	56.32	38
29.7	50.257	317	12.43	34	21.269	281	35.54	104	40.825	289	20.98	88	19.97	82	57.07	75
May 9.6	50.558	301	12.10	33	21.539	270	34.34	120	41.103	278	19.99	99	20.74	77	58.19	112
19.6	50.840	282	11.81	29	21.788	249	33.01	133	41.362	259	18.91	108	21.45	71	59.62	143
29.6	51.095	255	11.58	23	22.013	225	31.60	141	41.597	235	17.79	112	22.08	63	61.36	174
June 8.6	51.319	224	11.41	17	22.211	198	30.17	143	41.806	209	16.64	115	22.62	54	63.36	200
18.5	51.509	190	11.32	9	22.376	165	28.72	145	41.980	174	15.54	110	23.05	43	65.56	220
28.5	51.657	148	11.31	1 —	22.504	128	27.35	137	42.120	140	14.52	102	23.38	33	67.91	235
July 8.5	51.763	106	11.38	7	22.593	89	26.06	129	42.217	97	13.59	93	23.58	20	70.34	243
18.4	51.821	58	11.52	14	22.640	47	24.89	117	42.273	56	12.75	84	23.66	8 —	72.79	245
28.4	51.833	12 —	11.71	19	22.646	6 —	23.84	105	42.286	13 —	12.01	74	23.60	6	75.17	238
Aug. 7.4	51.799	34	11.94	23	22.608	38	22.93	91	42.257	29	11.39	62	23.43	17	77.40	223
17.4	51.722	77	12.17	23	22.535	73	22.20	73	42.188	69	10.90	49	23.14	29	79.40	200
27.3	51.608	114	12.40	23	22.426	109	21.60	60	42.084	104	10.53	37	22.75	39	81.09	169
Sept. 6.3	51.462	146	12.59	19	22.290	136	21.16	44	41.953	131	10.27	26	22.26	49	82.42	133
16.3	51.294	168	12.72	13	22.135	155	20.87	29	41.798	155	10.11	16	21.72	54	83.32	90
26.3	51.113	181	12.77	5 —	21.967	168	20.75	12 —	41.632	166	10.04	7 —	21.14	58	83.74	42 —
Oct. 6.2	50.930	183	12.74	3	21.797	170	20.79	4	41.462	170	10.07	3	20.54	60	83.65	9
16.2	50.758	172	12.63	11	21.635	162	20.98	19	41.303	159	10.20	13	19.96	58	83.06	59
26.2	50.604	154	12.43	20	21.492	143	21.31	33	41.157	146	10.40	20	19.42	54	81.96	110
Nov. 5.1	50.481	123	12.16	27	21.375	117	21.80	49	41.038	119	10.72	32	18.96	46	80.39	157
15.1	50.397	84	11.85	31	21.291	84	22.45	65	40.952	86	11.13	41	18.60	36	78.41	198
25.1	50.358	39 —	11.52	33	21.249	42	23.24	79	40.909	43	11.63	50	18.34	26	76.09	232
Dec. 5.1	50.368	10	11.19	33	21.248	1 —	24.19	95	40.907	2 —	12.24	61	18.21	13 —	73.50	259
15.0	50.428	60	10.88	31	21.292	44	25.25	106	40.952	45	12.94	70	18.23	2	70.74	276
25.0	50.537	109	10.60	28	21.380	88	26.40	115	41.038	86	13.72	78	18.37	14	67.90	284
35.0	50.692	155	10.37	23	21.510	130	27.61	121	41.169	131	14.53	81	18.64	27	65.07	283
Mean Place	47.209		9.43		18.673		25.95		38.155		13.41		13.415		66.93	
Sec δ, Tan δ	1.108		−0.476		1.001		−0.036		1.011		−0.146		3.152		−2.989	
Dψ α, Dω α	+0.07		0.00		+0.06		0.00		+0.06		0.00		+0.14		+0.03	
Dψ δ, Dω δ	0.0		−1.0		0.0		−1.0		+0.1		−1.0		+0.1		−1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Lyræ. (Vega.) Mag. 0.1				2 Aquilæ. Mag. 4.7				φ Sagittarii. Mag. 3.3				110 Herculis. Mag. 4.3			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	18 34		+38 41		18 37		− 9 7		18 40		−27 4		18 42		+20 27	
	s		″		s		″		s		″		s		″	
Jan. 1.0	4.418		71.60		40.044		67.76		24.025		47.06		1.957		48.75	
11.0	4.533	115	68.52	308	40.195	151	68.52	76	24.192	167	46.69	37	2.078	121	46.37	238
20.9	4.696	163	65.53	299	40.380	185	69.26	74	24.399	207	46.34	35	2.238	160	44.05	232
30.9	4.904	208	62.73	280	40.597	217	69.94	68	24.641	242	46.00	34	2.433	195	41.89	216
Feb. 9.9	5.152	248	60.24	249	40.840	243	70.54	60	24.911	270	45.68	32	2.659	226	39.95	194
19.9	5.430	278	58.15	209	41.104	264	71.00	46	25.204	293	45.35	33	2.910	251	38.33	162
29.8	5.736	306	56.55	160	41.384	280	71.28	28	25.517	313	45.00	35	3.181	271	37.11	122
Mar. 10.8	6.061	325	55.50	105	41.676	292	71.37	9	25.842	325	44.63	37	3.467	286	36.32	79
20.8	6.398	337	55.05	45	41.976	300	71.25	12	26.176	334	44.22	41	3.764	297	36.01	31
30.8	6.741	343	55.19	14	42.282	306	70.90	35	26.516	340	43.79	43	4.067	303	36.19	18
Apr. 9.7	7.083	342	55.92	73	42.586	304	70.35	55	26.856	340	43.33	46	4.371	304	36.84	65
19.7	7.416	333	57.21	129	42.888	302	69.61	74	27.194	338	42.88	45	4.671	300	37.94	110
29.7	7.733	317	59.01	180	43.182	294	68.73	88	27.523	329	42.44	44	4.962	291	39.45	151
May 9.6	8.030	297	61.24	223	43.464	282	67.73	100	27.839	316	42.03	41	5.238	276	41.29	184
19.6	8.297	267	63.84	260	43.728	264	66.64	109	28.136	297	41.68	35	5.493	255	43.43	214
29.6	8.532	235	66.71	287	43.970	242	65.52	112	28.410	274	41.41	27	5.724	231	45.76	233
June 8.6	8.725	193	69.77	306	44.184	214	64.39	113	28.653	243	41.22	19	5.924	200	48.23	247
18.5	8.875	150	72.92	315	44.367	183	63.30	109	28.860	207	41.13	9	6.088	164	50.76	253
28.5	8.978	103	76.08	316	44.513	146	62.28	102	29.028	168	41.15	2	6.214	126	53.29	253
July 3.5	9.030	52	79.17	309	44.619	106	61.35	93	29.151	123	41.26	11	6.297	83	55.74	245
18.5	9.032	2	82.12	295	44.682	63	60.54	81	29.228	77	41.46	20	6.337	40	58.06	232
28.4	8.983	49	84.87	275	44.702	20	59.82	72	29.257	29	41.74	28	6.333	4	60.20	214
Aug. 7.4	8.886	97	87.34	247	44.680	22	59.24	58	29.237	20	42.06	32	6.286	47	62.13	193
17.4	8.745	141	89.50	216	44.617	63	58.77	47	29.173	64	42.40	34	6.199	87	63.79	166
27.3	8.564	181	91.29	179	44.518	99	58.42	35	29.068	105	42.73	33	6.075	124	65.18	139
Sept. 6.3	8.351	213	92.70	141	44.389	129	58.18	24	28.930	138	43.03	30	5.921	154	66.25	107
16.3	8.114	237	93.67	97	44.238	151	58.03	15	28.765	165	43.26	23	5.745	176	66.99	74
26.3	7.863	251	94.20	53	44.072	166	57.97	6	28.585	150	43.41	15	5.554	191	67.41	42
Oct. 6.2	7.607	256	94.27	7	43.903	169	57.99	2	28.399	186	43.46	5	5.358	196	67.47	6
16.2	7.357	250	93.87	40	43.741	162	58.09	10	28.218	181	43.41	5	5.168	190	67.17	30
26.2	7.124	233	93.00	87	43.594	147	58.28	19	28.056	162	43.25	16	4.992	176	66.53	64
Nov. 5.2	6.918	206	91.68	132	43.473	121	58.56	28	27.923	133	42.98	27	4.841	151	65.55	98
15.1	6.749	169	89.92	176	43.383	90	58.93	37	27.825	98	42.66	32	4.720	121	64.23	132
25.1	6.622	127	87.77	215	43.333	50	59.38	45	27.769	56	42.27	39	4.638	82	62.60	163
Dec. 5.1	6.543	79	85.27	250	43.326	7	59.92	54	27.761	8	41.86	41	4.597	41	60.72	188
15.0	6.517	26	82.50	277	43.363	37	60.54	62	27.803	42	41.43	43	4.600	3	58.60	212
25.0	6.545	28	79.54	296	43.444	81	61.24	70	27.895	92	41.01	42	4.648	48	56.33	227
35.0	6.626	81	76.48	306	43.567	123	61.98	74	28.032	137	40.61	40	4.741	93	53.97	236
Mean Place	5.663		77.36		40.531		61.93		24.515		41.31		2.740		54.20	
Sec δ, Tan δ	1.281		+0.801		1.013		−0.161		1.123		−0.511		1.067		+0.373	
$D_\psi \alpha$, $D_\omega \alpha$	+0.04		−0.01		+0.07		0.00		+0.07		+0.01		+0.05		0.00	
$D_\psi \delta$, $D_\omega \delta$	+0.1		−1.0		+0.1		−1.0		+0.1		−1.0		+0.1		−1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	6 Aquilæ. Mag. 4.5				λ Pavonis. Mag. 4.4				β Lyræ. Var. 3.4–4.1				50 Draconis. Mag. 5.4			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	18 42		− 4 50		18 44		−62 16		18 46		+33 15		18 48		+75 19	
	s		″		s		″		s		″		s		″	
Jan. 1.0	42.542	143	24.98	100	24.92	25	72.39	241	57.626	104	47.19	287	59.33	1 —	63.40	345
11.0	42.685	178	25.98	98	25.17	33	69.98	233	57.730	150	44.32	283	59.32	16	59.95	343
21.0	42.863	208	26.96	92	25.50	40	67.65	216	57.880	190	41.49	264	59.48	32	56.52	328
30.9	43.071	235	27.88	78	25.90	47	65.49	198	58.070	227	38.85	239	59.80	46	53.24	297
Feb. 9.9	43.306	255	28.66	63	26.37	51	63.51	173	58.297	259	36.46	201	60.26	61	50.27	256
19.9	43.561	273	29.29	41	26.88	55	61.78	147	58.556	284	34.45	157	60.87	71	47.71	207
29.8	43.834	286	29.70	18 —	27.43	59	60.31	118	58.840	304	32.88	105	61.58	80	45.64	150
Mar. 10.8	44.120	294	29.88	8	28.02	60	59.13	89	59.144	318	31.83	49 —	62.38	86	44.14	87
20.8	44.414	300	29.80	34	28.62	61	58.24	57	59.462	325	31.34	7	63.24	88	43.27	20 —
30.8	44.714	301	29.46	59	29.23	62	57.67	26 —	59.787	327	31.41	63	64.12	88	43.07	47
Apr. 9.7	45.015	299	28.87	82	29.85	60	57.41	6	60.114	322	32.04	117	65.00	86	43.54	108
19.7	45.314	292	28.05	101	30.45	59	57.47	39	60.436	311	33.21	166	65.86	79	44.62	167
29.7	45.606	280	27.04	116	31.04	56	57.86	71	60.747	294	34.87	209	66.65	72	46.29	221
May 9.7	45.886	263	25.88	128	31.60	53	58.57	99	61.041	269	36.96	243	67.37	61	48.50	265
19.6	46.149	240	24.60	134	32.13	47	59.56	128	61.310	241	39.39	270	67.98	49	51.15	301
29.6	46.389	214	23.26	136	32.60	42	60.84	153	61.551	205	42.09	290	68.47	36	54.16	327
June 8.6	46.603	184	21.90	133	33.02	35	62.37	174	61.756	165	44.99	300	68.83	22	57.43	344
18.5	46.787	145	20.57	128	33.37	26	64.11	190	61.921	122	47.99	302	69.05	7 —	60.87	353
28.5	46.932	107	19.29	119	33.63	19	66.01	201	62.043	74	51.01	297	69.12	7	64.40	351
July 8.5	47.039	64	18.10	107	33.82	11	68.02	206	62.117	27 —	53.98	283	69.05	23	67.91	343
18.5	47.103	22 —	17.03	94	33.93	1 —	70.08	204	62.144	22	56.81	266	68.82	36	71.34	324
28.4	47.125	20	16.09	81	33.94	8	72.12	196	62.122	69	59.47	241	68.46	50	74.58	298
Aug. 7.4	47.105	63	15.28	66	33.86	15	74.08	179	62.053	113	61.88	211	67.96	62	77.56	269
17.4	47.042	96	14.62	52	33.71	24	75.87	156	61.940	152	63.99	178	67.34	73	80.25	231
27.4	46.946	127	14.10	37	33.47	29	77.43	125	61.788	184	65.77	142	66.61	81	82.56	189
Sept. 6.3	46.819	149	13.73	25	33.18	35	78.68	91	61.604	210	67.19	102	65.80	88	84.45	146
16.3	46.670	165	13.48	11 —	32.83	37	79.59	51	61.394	225	68.21	60	64.92	93	85.91	94
26.3	46.505	168	13.37	2	32.46	39	80.10	7 —	61.169	232	68.81	17 —	63.99	95	86.85	44 —
Oct. 6.2	46.337	164	13.39	13	32.07	39	80.17	38	60.937	228	68.98	26	63.04	95	87.29	11
16.2	46.173	148	13.52	29	31.68	35	79.79	81	60.709	212	68.72	71	62.09	92	87.18	65
26.2	46.025	125	13.81	37	31.33	31	78.98	124	60.497	191	68.01	113	61.17	87	86.53	117
Nov. 5.2	45.900	92	14.18	51	31.02	25	77.74	160	60.306	157	66.88	155	60.30	80	85.36	172
15.1	45.808	53	14.69	65	30.77	16	76.14	192	60.149	118	65.33	192	59.50	69	83.64	217
25.1	45.755	16 —	15.34	75	30.61	9 —	74.22	217	60.031	74	63.41	227	58.81	57	81.47	261
Dec. 5.1	45.739	31	16.09	86	30.52	1	72.05	233	59.957	26 —	61.14	255	58.24	43	78.86	298
15.1	45.770	74	16.95	94	30.53	10	69.72	244	59.931	24	58.59	273	57.81	28	75.88	325
25.0	45.844	115	17.89	98	30.63	20	67.28	246	59.955	72	55.86	286	57.53	11	72.63	340
35.0	45.959		18.87		30.83		64.82		60.027		53.00		57.42		69.23	
Mean Place	43.048		19.26		26.221		66.89		58.704		52.03		65.505		66.80	
Sec δ, Tan δ	1.004		−0.085		2.150		−1.904		1.196		+0.656		3.950		+3.821	
$D_\psi \alpha$, $D_\omega \alpha$	+0.06		0.00		+0.11		+0.02		+0.04		−0.01		−0.04		−0.05	
$D_\psi \delta$, $D_\omega \delta$	+0.1		−1.0		+0.1		−1.0		+0.1		−1.0		+0.1		−1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	*o* Draconis. Mag. 4.8				*σ* Sagittarii. Mag. 2.1				*θ* Serpentis *pr.* Mag. 4.5				R Lyræ. Var. 4.0–4.7			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	18 49		+59 16		18 50		−26 24		18 52		+ 4 5		18 52		+43 49	
	s		″		s		″		s		″		s		″	
Jan. 1.0	55.238	62	63.60	345	2.915	156	13.81	37	2.033	126	30.89	149	45.291	85	61.51	318
11.0	55.350	142	60.15	341	3.071	197	13.44	35	2.159	161	29.40	146	45.376	139	58.33	314
21.0	55.492	215	56.74	324	3.268	230	13.09	35	2.320	192	27.94	137	45.515	189	55.19	296
30.9	55.707	286	53.50	293	3.498	261	12.74	35	2.512	221	26.57	119	45.704	235	52.23	268
Feb. 9.9	55.993	346	50.57	253	3.759	284	12.39	37	2.733	243	25.38	98	45.939	274	49.55	230
19.9	56.339	396	48.04	202	4.043	304	12.02	40	2.976	263	24.40	70	46.213	307	47.25	182
29.8	56.735	436	46.02	143	4.347	318	11.62	43	3.239	277	23.70	39	46.520	332	45.43	128
Mar. 10.8	57.171	461	44.59	80	4.665	329	11.19	48	3.516	287	23.31	6	46.852	351	44.15	67
20.8	57.632	476	43.79	13	4.994	336	10.71	51	3.803	295	23.25	30	47.203	362	43.48	4
30.8	58.108	478	43.66	53	5.330	338	10.20	54	4.098	298	23.55	63	47.565	363	43.44	56
Apr. 9.7	58.586	467	44.19	116	5.668	337	9.66	55	4.396	296	24.18	94	47.928	359	44.00	115
19.7	59.053	442	45.35	175	6.005	331	9.11	54	4.692	290	25.12	123	48.287	344	45.15	170
29.7	59.495	407	47.10	226	6.336	320	8.57	51	4.982	280	26.35	144	48.631	325	46.85	218
May 9.7	59.902	362	49.36	271	6.656	301	8.06	45	5.262	262	27.79	164	48.956	295	49.03	258
19.6	60.264	307	52.07	306	6.957	280	7.61	37	5.524	242	29.43	174	49.251	260	51.61	290
29.6	60.571	245	55.13	331	7.237	250	7.24	27	5.766	215	31.17	182	49.511	218	54.51	313
June 8.6	60.816	177	58.44	347	7.487	215	6.97	16	5.981	183	32.99	182	49.729	172	57.64	327
18.5	60.993	103	61.91	354	7.702	176	6.81	6	6.164	147	34.81	179	49.901	121	60.91	332
28.5	61.096	30	65.45	352	7.878	133	6.75	5	6.311	108	36.60	170	50.022	67	64.23	329
July 8.5	61.126	47	68.97	342	8.011	85	6.80	15	6.419	66	38.30	158	50.089	12	67.52	317
18.5	61.079	120	72.39	322	8.096	38	6.95	24	6.485	23	39.88	144	50.101	42	70.69	298
28.4	60.959	191	75.61	296	8.134	11	7.19	29	6.508	20	41.32	127	50.059	97	73.67	274
Aug. 7.4	60.768	255	78.57	264	8.123	56	7.48	33	6.488	60	42.59	107	49.962	145	76.41	243
17.4	60.513	312	81.21	226	8.067	97	7.81	34	6.428	95	43.66	88	49.817	188	78.84	207
27.4	60.201	360	83.47	184	7.970	134	8.15	32	6.333	127	44.54	66	49.629	227	80.91	167
Sept. 6.3	59.841	398	85.31	138	7.836	160	8.47	25	6.206	150	45.20	47	49.402	255	82.58	124
16.3	59.443	422	86.69	88	7.676	178	8.72	19	6.056	166	45.67	24	49.147	274	83.82	78
26.3	59.021	433	87.57	36	7.498	185	8.91	10	5.890	172	45.91	4	48.873	282	84.60	31
Oct. 6.2	58.588	431	87.93	17	7.313	180	9.01	0	5.718	167	45.95	17	48.591	280	84.91	19
16.2	58.157	415	87.76	71	7.133	163	9.01	10	5.551	155	45.78	38	48.311	266	84.72	68
26.2	57.742	384	87.05	125	6.970	140	8.91	19	5.396	133	45.40	59	48.045	243	84.04	116
Nov. 5.2	57.358	340	85.80	176	6.830	103	8.72	28	5.263	103	44.81	79	47.802	207	82.88	164
15.1	57.018	284	84.04	223	6.727	62	8.44	33	5.160	67	44.02	98	47.595	166	81.24	207
25.1	56.734	221	81.81	265	6.665	16	8.11	37	5.093	27	43.04	116	47.429	118	79.17	246
Dec. 5.1	56.513	148	79.16	300	6.649	32	7.74	39	5.066	15	41.88	130	47.311	63	76.71	276
15.1	56.365	70	76.16	326	6.681	80	7.35	39	5.081	57	40.58	141	47.248	8	73.95	301
25.0	56.295	10	72.90	340	6.761	127	6.96	39	5.138	99	39.17	147	47.240	48	70.94	314
35.0	56.305		69.50		6.888		6.57		5.237		37.70		47.288		67.80	
Mean Place	57.842		67.39		3.394		7.93		2.600		36.22		46.762		65.54	
Sec δ, Tan δ	1.958		+1.683		1.116		−0.496		1.003		+0.071		1.386		+0.960	
$D_\psi a$, $D_\omega a$	+0.02		−0.02		+0.07		+0.01		+0.06		0.00		+0.04		−0.01	
$D_\psi \delta$, $D_\omega \delta$	+0.1		−1.0		+0.1		−1.0		+0.1		−1.0		+0.1		−1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Lyræ. Mag. 3.3				ε Aquilæ. Mag. 4.2				ζ Sagittarii. Mag. 2.7				ζ Aquilæ. Mag. 3.0			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	18 55		+32 34		18 55		+14 56		18 57		−30 0		19 1		+13 44	
	s		″		s		″		s		″		s		″	
Jan. 1.0	46.993	94	20.72	283	47.885	113	67.14	206	15.579	153	11.22	62	32.267	107	11.30	199
11.0	47.087	140	17.89	278	47.998	149	65.08	202	15.732	194	10.60	61	32.374	144	9.31	195
21.0	47.227	182	15.11	263	48.147	183	63.06	190	15.926	230	9.99	60	32.518	179	7.36	184
30.9	47.409	218	12.48	238	48.330	214	61.16	169	16.156	262	9.39	59	32.697	210	5.52	163
Feb. 9.9	47.627	250	10.10	203	48.544	238	59.47	142	16.418	287	8.80	59	32.907	234	3.89	139
19.9	47.877	276	8.07	159	48.782	260	58.05	107	16.705	309	8.21	59	33.141	256	2.50	103
29.8	48.153	299	6.48	109	49.042	276	56.98	68	17.014	324	7.62	60	33.397	273	1.47	66
Mar. 10.8	48.452	313	5.39	54	49.318	289	56.30	25	17.338	337	7.02	60	33.670	286	0.81	24
20.8	48.765	322	4.85	3	49.607	296	56.05	18	17.675	345	6.42	59	33.956	294	0.57	19
30.8	49.087	326	4.88	58	49.903	300	56.23	62	18.020	349	5.83	59	34.250	300	0.76	61
Apr. 9.7	49.413	323	5.46	111	50.203	298	56.85	102	18.369	349	5.24	56	34.550	299	1.37	101
19.7	49.736	314	6.57	160	50.501	292	57.87	139	18.718	343	4.68	52	34.849	294	2.38	137
29.7	50.050	297	8.17	204	50.793	281	59.26	172	19.061	332	4.16	45	35.143	283	3.75	168
May 9.7	50.347	277	10.21	238	51.074	262	60.98	195	19.393	316	3.71	36	35.426	267	5.43	193
19.6	50.624	247	12.59	268	51.336	241	62.93	216	19.709	292	3.35	24	35.693	246	7.36	212
29.6	50.871	213	15.27	286	51.577	212	65.09	228	20.001	264	3.11	14	35.939	217	9.48	224
June 8.6	51.084	175	18.13	298	51.789	180	67.37	234	20.265	228	2.97	2	36.156	186	11.72	228
18.5	51.259	131	21.11	302	51.969	143	69.71	231	20.493	189	2.95	12	36.342	149	14.00	228
28.5	51.390	85	24.13	297	52.112	102	72.02	224	20.682	144	3.07	24	36.491	108	16.28	222
July 8.5	51.475	38	27.10	285	52.214	59	74.26	215	20.826	95	3.31	34	36.599	66	18.50	209
18.5	51.513	11	29.95	267	52.273	16	76.41	198	20.921	45	3.65	43	36.665	22	20.59	194
28.4	51.502	59	32.62	245	52.289	28	78.39	177	20.966	5	4.08	48	36.687	21	22.53	174
Aug. 7.4	51.443	103	35.07	216	52.261	68	80.16	154	20.961	52	4.56	51	36.666	63	24.27	152
17.4	51.340	142	37.23	184	52.193	105	81.70	128	20.909	95	5.07	50	36.603	99	25.79	126
27.4	51.198	177	39.07	147	52.088	136	82.98	101	20.814	134	5.57	45	36.504	132	27.05	101
Sept. 6.3	51.021	204	40.54	109	51.952	162	83.99	71	20.680	162	6.02	39	36.372	157	28.06	72
16.3	50.817	219	41.63	68	51.790	176	84.70	43	20.518	182	6.41	28	36.215	173	28.78	44
26.3	50.598	228	42.31	25	51.614	184	85.13	12	20.336	190	6.69	15	36.042	181	29.22	14
Oct. 6.2	50.370	226	42.56	18	51.430	181	85.25	19	20.146	188	6.84	2	35.861	179	29.36	16
16.2	50.144	212	42.38	61	51.249	168	85.06	48	19.958	173	6.86	12	35.682	167	29.20	44
26.2	49.932	191	41.77	104	51.081	148	84.58	80	19.785	148	6.74	27	35.515	148	28.76	75
Nov. 5.2	49.741	160	40.73	146	50.933	118	83.78	109	19.637	114	6.47	38	35.367	118	28.01	102
15.1	49.581	122	39.27	183	50.815	83	82.69	135	19.523	71	6.09	47	35.249	85	26.99	129
25.1	49.459	80	37.44	218	50.732	43	81.34	160	19.452	25	5.62	56	35.164	46	25.70	152
Dec. 5.1	49.379	33	35.26	246	50.689	1	79.74	180	19.427	24	5.06	60	35.118	4	24.18	173
15.1	49.346	16	32.80	268	50.688	42	77.94	195	19.451	74	4.46	62	35.114	40	22.45	187
25.0	49.362	64	30.12	279	50.730	84	75.99	203	19.525	121	3.84	63	35.154	79	20.58	196
35.0	49.426		27.33		50.814		73.96		19.646		3.21		35.233		18.62	
Mean Place	48.054		24.91		48.579		71.98		16.066		5.20		32.941		15.90	
Sec δ, Tan δ	1.187		+0.639		1.035		+0.267		1.155		−0.577		1.029		+0.244	
$D_\psi \alpha$, $D_\omega \alpha$	+0.04		−0.01		+0.05		0.00		+0.08		+0.01		+0.05		0.00	
$D_\psi \delta$, $D_\omega \delta$	+0.1		−1.0		+0.1		−1.0		+0.1		−1.0		+0.1		−1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	**λ Aquilæ.** Mag. 3.6				**α Coronæ Australis.** Mag. 4.1				**ι Lyræ.** Mag. 5.1				**π Sagittarii.** Mag. 3.0			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	19 1		− 5 0		19 3		−38 2		19 4		+35 57		19 4		−21 9	
	s		″		s		″		s		″		s		″	
Jan. 1.0	46.973		38.80		44.930		18.01		17.114		60.64		45.692		35.05	
		123		94		156		115		81		291		135		8
11.0	47.096		39.74		45.086		16.86		17.195		57.73		45.827		34.97	
		160		91		202		111		128		289		174		10
21.0	47.256		40.65		45.288		15.75		17.323		54.84		46.001		34.87	
		190		83		243		110		173		275		207		12
30.9	47.446		41.48		45.531		14.65		17.496		52.09		46.208		34.75	
		219		71		277		105		212		249		236		16
Feb. 9.9	47.665		42.19		45.808		13.60		17.708		49.60		46.444		34.59	
		242		56		308		100		247		215		263		23
19.9	47.907		42.75		46.116		12.60		17.955		47.45		46.707		34.36	
		262		36		331		94		276		171		281		30
29.9	48.169		43.11		46.447		11.66		18.231		45.74		46.988		34.06	
		277		11		351		88		301		121		299		40
Mar. 10.8	48.446		43.22	—	46.798		10.78		18.532		44.53		47.287		33.66	
		289		15		365		81		318		66		310		49
20.8	48.735		43.07		47.163		9.97		18.850		43.87		47.597		33.17	
		297		39		376		72		330		7		320		58
30.8	49.032		42.68		47.539		9.25		19.180		43.80	—	47.917		32.59	
		301		65		381		63		335		51		325		67
Apr. 9.7	49.333		42.03		47.920		8.62		19.515		44.31		48.242		31.92	
		302		87		381		53		333		106		326		74
19.7	49.635		41.16		48.301		8.09		19.848		45.37		48.568		31.18	
		299		107		376		40		325		157		322		76
29.7	49.934		40.09		48.677		7.69		20.173		46.94		48.890		30.42	
		289		123		366		25		309		203		314		78
May 9.7	50.223		38.86		49.043		7.44		20.482		48.97		49.204		29.64	
		275		133		347		11		287		240		298		76
19.6	50.498		37.53		49.390		7.33	—	20.769		51.37		49.502		28.88	
		254		140		323		6		259		272		280		70
29.6	50.752		36.13		49.713		7.39		21.028		54.09		49.782		28.18	
		230		141		292		24		223		295		252		63
June 8.6	50.982		34.72		50.005		7.63		21.251		57.04		50.034		27.55	
		199		139		254		39		184		307		220		54
18.6	51.181		33.33		50.259		8.02		21.435		60.11		50.254		27.01	
		162		133		209		55		139		313		182		43
28.5	51.343		32.00		50.468		8.57		21.574		63.24		50.436		26.58	
		124		123		161		69		91		310		142		31
July 8.5	51.467		30.77		50.629		9.26		21.665		66.34		50.578		26.27	
		82		111		108		80		42		299		96		18
18.5	51.549		29.66		50.737		10.06		21.707	—	69.33		50.674		26.09	
		38		99		54		88		9		284		50		8
28.4	51.587	—	28.67		50.791	—	10.94		21.698		72.17		50.724		26.01	—
		5		83		2		91		58		260		3		2
Aug. 7.4	51.582		27.84		50.789		11.85		21.640		74.77		50.727	—	26.03	
		46		68		55		90		104		233		42		10
17.4	51.536		27.16		50.734		12.75		21.536		77.10		50.685		26.13	
		85		53		103		85		147		199		84		15
27.4	51.451		26.63		50.631		13.60		21.389		79.09		50.601		26.28	
		117		39		144		75		182		162		120		18
Sept. 6.3	51.334		26.24		50.487		14.35		21.207		80.71		50.481		26.46	
		142		24		178		61		211		123		146		19
16.3	51.192		26.00		50.309		14.96		20.996		81.94		50.335		26.65	
		160		11		200		44		229		81		168		17
26.3	51.032		25.89	—	50.109		15.40		20.767		82.75		50.167		26.82	
		167		1		213		23		239		37		175		14
Oct. 6.3	50.865		25.90		49.896		15.63		20.528		83.12	—	49.992		26.96	
		164		13		208		2		239		9		173		9
16.2	50.701		26.03		49.688		15.65	—	20.289		83.03		49.819		27.05	
		153		26		196		22		228		54		161		5
26.2	50.548		26.29		49.492		15.43		20.061		82.49		49.658		27.10	
		133		37		169		42		207		99		140		0
Nov. 5.2	50.415		26.66		49.323		15.01		19.854		81.50		49.518		27.10	
		102		49		133		64		177		142		107		5
15.1	50.313		27.15		49.190		14.37		19.677		80.08		49.411		27.05	
		68		60		89		80		141		183		70		7
25.1	50.245		27.75		49.101		13.57		19.536		78.25		49.341		26.98	
		28		71		39		94		97		220		28		9
Dec. 5.1	50.217	—	28.46		49.062	—	12.63		19.439		76.05		49.313	—	26.89	
		13		80		15		104		50		250		17		9
15.1	50.230		29.26		49.077		11.59		19.389		73.55		49.330		26.80	
		56		88		69		111		1		273		62		9
25.0	50.286		30.14		49.146		10.48		19.388	—	70.82		49.392		26.71	
		95		91		122		114		49		287		106		10
35.0	50.381		31.05		49.268		9.34		19.437		67.95		49.498		26.61	
Mean Place	47.467		33.46		45.474		11.72		18.278		64.02		46.144		29.17	
Sec δ, Tan δ	1.004		−0.088		1.270		−0.782		1.235		+0.726		1.072		−0.387	
$D_\psi a$, $D_\omega a$	+0.06		0.00		+0.08		+0.01		+0.04		−0.01		+0.07		+0.01	
$D_\psi \delta$, $D_\omega \delta$	+0.1		−1.0		+0.1		−1.0		+0.1		−1.0		+0.1		−1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ψ Sagittarii. Mag. 4.9				δ Draconis. Mag. 3.2				d Sagittarii. Mag. 5.0				θ Lyræ. Mag. 4.5			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	19 10		−25 24		19 12		+67 30		19 12		−19 6		19 13		+37 58	
	s		″		s		″		s		″		s		″	
Jan. 1.0	22.998		15.03		28.61		48.47		42.808		17.93		25.874		58.34	
11.0	23.130	132	14.66	37	28.60	1 —	45.06	341	42.932	124	17.95	2	25.942	68	55.39	295
21.0	23.303	173	14.28	38	28.68	8	41.61	345	43.096	164	17.95	0	26.059	117	52.45	294
30.9	23.511	208	13.88	40	28.87	19	38.27	334	43.292	196	17.91	4	26.221	162	49.63	282
Feb. 9.9	23.750	239	13.45	43	29.17	30	35.18	309	43.517	225	17.82	9	26.425	204	47.05	258
19.9	24.016	266	12.99	46	29.55	38	32.44	274	43.769	252	17.65	17	26.665	240	44.80	225
29.9	24.302	286	12.48	51	30.01	46	30.16	228	44.040	271	17.37	28	26.940	275	42.99	181
Mar. 10.8	24.608	306	11.91	57	30.55	54	28.44	172	44.330	290	16.99	38	27.240	300	41.68	131
20.8	24.926	318	11.29	62	31.12	57	27.33	111	44.634	304	16.49	50	27.560	320	40.93	75
30.8	25.255	329	10.62	67	31.72	60	26.88	45 —	44.947	313	15.88	61	27.894	334	40.77	16 —
Apr. 9.7	25.589	334	9.91	71	32.34	62	27.08	20	45.267	320	15.15	73	28.236	342	41.19	42
19.7	25.926	337	9.18	73	32.95	61	27.94	86	45.589	322	14.35	80	28.578	342	42.19	100
29.7	26.260	334	8.46	72	33.53	58	29.42	148	45.909	320	13.50	85	28.912	334	43.71	152
May 9.7	26.585	325	7.77	69	34.06	53	31.45	203	46.221	312	12.61	89	29.233	321	45.71	200
19.6	26.895	310	7.13	64	34.54	48	33.97	252	46.519	298	11.73	88	29.531	298	48.11	240
29.6	27.186	291	6.57	56	34.96	42	36.89	292	46.799	280	10.88	85	29.801	270	50.84	273
June 8.6	27.450	264	6.12	45	35.30	34	40.11	322	47.053	254	10.10	78	30.036	235	53.81	297
18.6	27.683	233	5.78	34	35.54	24	43.56	345	47.276	223	9.42	68	30.231	195	56.93	312
28.5	27.877	194	5.58	20	35.69	15	47.13	357	47.465	189	8.84	58	30.380	149	60.12	319
July 8.5	28.028	151	5.50	8 —	35.73	4 —	50.74	361	47.611	146	8.38	46	30.480	100	63.31	319
18.5	28.133	105	5.54	4	35.69	4	54.29	355	47.714	103	8.04	34	30.529	49 —	66.40	309
28.4	28.189	56	5.70	16	35.54	15	57.71	342	47.770	56	7.84	20	30.525	4	69.34	294
Aug. 7.4	28.198	9 —	5.95	25	35.30	24	60.93	322	47.780	10 —	7.74	10	30.471	54	72.06	272
17.4	28.160	38	6.26	31	34.98	32	63.85	292	47.745	35	7.74	0	30.369	102	74.51	245
27.4	28.078	82	6.60	34	34.56	42	66.44	259	47.669	76	7.81	7	30.223	146	76.63	212
Sept. 6.3	27.959	119	6.95	35	34.08	48	68.63	219	47.555	114	7.93	12	30.039	184	78.38	175
16.3	27.811	148	7.28	33	33.56	52	70.38	175	47.414	141	8.08	15	29.826	213	79.74	136
26.3	27.641	170	7.54	26	32.99	57	71.65	127	47.252	162	8.24	16	29.591	235	80.69	95
Oct. 6.3	27.460	181	7.74	20	32.40	59	72.41	76	47.081	171	8.40	16	29.345	246	81.18	49
16.2	27.280	180	7.85	11	31.80	60	72.63	22 —	46.909	172	8.53	13	29.098	247	81.20	2 —
26.2	27.113	167	7.86	1 —	31.21	59	72.30	33	46.749	160	8.63	10	28.860	238	80.76	44
Nov. 5.2	26.966	147	7.78	8	30.65	56	71.42	88	46.608	141	8.70	7	28.642	218	79.86	90
15.1	26.851	115	7.61	17	30.13	52	69.99	143	46.497	111	8.74	4	28.451	191	78.50	136
25.1	26.773	78	7.36	25	29.69	44	68.06	193	46.422	75	8.77	3	28.297	154	76.72	178
Dec. 5.1	26.739	34 —	7.07	29	29.31	38	65.65	241	46.388	34 —	8.78	1	28.186	111	74.55	217
15.1	26.751	12	6.74	33	29.02	29	62.86	279	46.397	9	8.80	2	28.121	65	72.06	249
25.0	26.809	58	6.38	36	28.83	19	59.73	313	46.450	53	8.81	1	28.105	16 —	69.32	274
35.0	26.911	102	6.01	37	28.74	9	56.40	333	46.547	97	8.83	2	28.141	36	66.43	289
Mean Place	23.449		8.98		32.392		49.52		43.247		12.12		27.107		60.86	
Sec δ, Tan δ	1.107		−0.475		2.615		+2.416		1.058		−0.346		1.269		+0.781	
$D_\psi \alpha$, $D_\omega \alpha$	+0.07		+0.01		0.00		−0.05		+0.07		+0.01		+0.04		−0.02	
$D_\psi \delta$, $D_\omega \delta$	+0.1		−1.0		+0.1		−1.0		+0.1		−1.0		+0.1		−0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ω Aquilæ. Mag. 5.1				κ Cygni. Mag. 4.0				τ Draconis. Mag. 4.6				δ Aquilæ. Mag. 3.4			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	19 13		+11 26		19 15		+53 12		19 17		+73 11		19 21		+ 2 56	
	s		″		s		″		s		″		s		″	
Jan. 1.0	51.784		31.00		7.719		45.45		5.35		59.36		15.259		42.79	
		97		183		35		329		8		338		97		133
11.0	51.881		29.17		7.754		42.16		5.27	—	55.98		15.356		41.46	
		134		180		102		332		6		343		135		131
21.0	52.015		27.37		7.856		38.84		5.33		52.55		15.491		40.15	
		169		169		165		319		20		334		167		122
30.9	52.184		25.68		8.021		35.65		5.53		49.21		15.658		38.93	
		199		152		225		295		34		312		195		108
Feb. 9.9	52.383		24.16		8.246		32.70		5.87		46.09		15.853		37.85	
		224		127		279		260		47		279		223		88
19.9	52.607		22.89		8.525		30.10		6.34		43.30		16.076		36.97	
		247		96		326		214		57		234		244		61
29.9	52.854		21.93		8.851		27.96		6.91		40.96		16.320		36.36	
		266		60		364		160		66		180		263		32
Mar. 10.8	53.120		21.33		9.215		26.36		7.57		39.16		16.583		36.04	
		281		21		393		98		73		121		278		1
20.8	53.401		21.12	—	9.608		25.38		8.30		37.95		16.861		36.03	—
		291		20		412		36		77		54		289		34
30.8	53.692		21.32		10.020		25.02	—	9.07		37.41	—	17.150		36.37	
		298		61		421		29		78		10		297		66
Apr. 9.8	53.990		21.93		10.441		25.31		9.85		37.51		17.447		37.03	
		300		98		420		93		78		76		300		95
19.7	54.290		22.91		10.861		26.24		10.63		38.27		17.747		37.98	
		297		133		407		151		75		138		299		124
29.7	54.587		24.24		11.268		27.75		11.38		39.65		18.046		39.22	
		288		163		386		205		69		193		293		146
May 9.7	54.875		25.87		11.654		29.80		12.07		41.58		18.339		40.68	
		275		186		354		252		62		243		280		165
19.6	55.150		27.73		12.008		32.32		12.69		44.01		18.619		42.33	
		253		206		313		289		51		284		261		176
29.6	55.403		29.79		12.321		35.21		13.20		46.85		18.880		44.09	
		229		216		264		319		42		317		239		183
June 8.6	55.632		31.95		12.585		38.40		13.62		50.02		19.119		45.92	
		197		221		210		339		29		340		208		185
18.6	55.829		34.16		12.795		41.79		13.91		53.42		19.327		47.77	
		161		220		149		349		17		356		174		181
28.5	55.990		36.36		12.944		45.28		14.08		56.98		19.501		49.58	
		122		214		85		352		5		359		136		173
July 8.5	56.112		38.50		13.029		48.80		14.13	—	60.57		19.637		51.31	
		79		203		21		345		10		355		95		161
18.5	56.191		40.53		13.050	—	52.25		14.03		64.12		19.732		52.92	
		36		188		47		331		22		345		50		147
28.5	56.227	—	42.41		13.003		55.56		13.81		67.57		19.782		54.39	
		8		168		109		309		34		325		6		130
Aug. 7.4	56.219		44.09		12.894		58.65		13.47		70.82		19.788	—	55.69	
		49		148		169		281		45		299		35		110
17.4	56.170		45.57		12.725		61.46		13.02		73.81		19.753		56.79	
		88		123		223		246		57		265		75		92
27.4	56.082		46.80		12.502		63.92		12.45		76.46		19.678		57.71	
		122		99		270		207		64		228		109		70
Sept. 6.3	55.960		47.79		12.232		65.99		11.81		78.74		19.569		58.41	
		147		72		308		164		71		184		135		51
16.3	55.813		48.51		11.924		67.63		11.10		80.58		19.434		58.92	
		167		46		334		117		77		138		155		30
26.3	55.646		48.97		11.590		68.80		10.33		81.96		19.279		59.22	
		176		18		351		67		81		88		167		10
Oct. 6.3	55.470		49.15	—	11.239		69.47		9.52		82.84		19.112		59.32	—
		175		9		352		16		82		34		166		9
16.2	55.295		49.06		10.887		69.63	—	8.70		83.18	—	18.946		59.23	
		165		37		344		38		80		21		158		30
26.2	55.130		48.69		10.543		69.25		7.90		82.97		18.788		58.93	
		149		64		324		90		78		76		142		48
Nov. 5.2	54.981		48.05		10.219		68.35		7.12		82.21		18.646		58.45	
		121		90		290		143		72		131		114		68
15.2	54.860		47.15		9.929		66.92		6.40		80.90		18.532		57.77	
		89		116		247		191		64		182		84		84
25.1	54.771		45.99		9.682		65.01		5.76		79.08		18.448		56.93	
		52		137		196		235		56		231		48		101
Dec. 5.1	54.719		44.62		9.486		62.66		5.20		76.77		18.400		55.92	
		11		156		136		273		43		272		8		115
15.1	54.708	—	43.06		9.350		59.93		4.77		74.05		18.392	—	54.77	
		30		172		74		304		31		306		32		125
25.0	54.738		41.34		9.276		56.89		4.46		70.99		18.424		53.52	
		70		179		6		322		17		328		72		131
35.0	54.808		39.55		9.270		53.67		4.29		67.71		18.496		52.21	
Mean Place	52.420		35.12		9.742		46.93		10.673		59.63		15.794		47.17	
Sec δ, Tan δ	1.020		+0.202		1.670		+1.337		3.460		+3.312		1.001		+0.051	
Dψ α, Dω α	+0.06		0.00		+0.03		−0.03		−0.02		−0.07		+0.06		0.00	
Dψ δ, Dω δ	+0.1		−0.9		+0.1		−0.9		+0.1		−0.9		+0.1		−0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Cygni. Mag. 3.2				ι Cygni. Mag. 3.9				μ Aquilæ. Mag. 4.6				h Sagittarii. Mag. 4.7			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 19 27		° ′ +27 46		h m 19 27		° ′ +51 32		h m 19 29		° ′ + 7 11		h m 19 31		° ′ −25 4	
	s		″		s		″		s		″		s		″	
Jan. 1.0	19.086	67	54.81	254	33.426	21	60.96	322	58.613	86	55.86	155	35.392	109	18.14	40
11.0	19.153	109	52.27	254	33.447	84	57.74	326	58.699	122	54.31	152	35.501	150	17.74	44
21.0	19.262	148	49.73	244	33.531	147	54.48	317	58.821	156	52.79	145	35.651	185	17.30	48
31.0	19.410	184	47.29	224	33.678	203	51.31	296	58.977	186	51.34	129	35.836	217	16.82	53
Feb. 9.9	19.594	218	45.05	195	33.881	257	48.35	262	59.163	213	50.05	106	36.053	245	16.29	58
19.9	19.812	246	43.10	157	34.138	303	45.73	220	59.376	237	48.99	79	36.298	270	15.71	64
29.9	20.058	271	41.53	112	34.441	343	43.53	167	59.613	258	48.20	47	36.568	290	15.07	72
Mar. 10.8	20.329	290	40.41	63	34.784	374	41.86	110	59.871	273	47.73	11	36.858	308	14.35	78
20.8	20.619	306	39.78	10	35.158	396	40.76	45	60.144	286	47.62	25	37.166	320	13.57	83
30.8	20.925	314	39.68	42	35.554	408	40.31	18	60.430	296	47.87	61	37.486	331	12.74	88
Apr. 9.8	21.239	319	40.10	93	35.962	410	40.49	80	60.726	300	48.48	95	37.817	336	11.86	90
19.7	21.558	315	41.03	142	36.372	401	41.29	140	61.026	299	49.43	128	38.153	336	10.96	90
29.7	21.873	306	42.45	183	36.773	385	42.69	196	61.325	295	50.71	155	38.489	333	10.06	87
May 9.7	22.179	292	44.28	220	37.158	357	44.65	242	61.620	283	52.26	175	38.822	321	9.19	81
19.7	22.471	268	46.48	249	37.515	320	47.07	280	61.903	265	54.01	191	39.143	303	8.38	71
29.6	22.739	241	48.97	269	37.835	276	49.87	313	62.168	242	55.92	201	39.446	280	7.67	60
June 8.6	22.980	206	51.66	283	38.111	225	53.00	334	62.410	212	57.93	206	39.726	249	7.07	47
18.6	23.186	167	54.49	289	38.336	168	56.34	347	62.622	179	59.99	203	39.975	213	6.60	33
28.5	23.353	123	57.38	287	38.504	105	59.81	351	62.801	141	62.02	197	40.188	171	6.27	16
July 8.5	23.476	78	60.25	280	38.609	44	63.32	347	62.942	98	63.99	187	40.359	125	6.11	3
18.5	23.554	30	63.05	264	38.653	20	66.79	335	63.040	55	65.86	172	40.484	78	6.08	11
28.5	23.584	18	65.69	246	38.633	83	70.14	315	63.095	11	67.58	152	40.562	28	6.19	23
Aug. 7.4	23.566	62	68.15	219	38.550	143	73.29	287	63.106	31	69.10	134	40.590	20	6.42	31
17.4	23.504	105	70.34	193	38.407	196	76.16	256	63.075	72	70.44	111	40.570	65	6.73	37
27.4	23.399	140	72.27	159	38.211	244	78.72	218	63.003	106	71.55	89	40.505	105	7.10	40
Sept. 6.4	23.259	171	73.86	124	37.967	282	80.90	176	62.897	134	72.44	65	40.400	136	7.50	39
16.3	23.088	192	75.10	88	37.685	311	82.66	131	62.763	154	73.09	43	40.264	162	7.89	36
26.3	22.896	204	75.98	49	37.374	328	83.97	81	62.609	168	73.52	17	40.102	175	8.25	29
Oct. 6.3	22.692	207	76.47	9	37.046	335	84.78	31	62.441	170	73.69	6	39.927	179	8.54	21
16.2	22.485	201	76.56	32	36.711	328	85.09	21	62.271	161	73.63	30	39.748	170	8.75	12
26.2	22.284	184	76.24	72	36.383	310	84.88	75	62.110	147	73.33	52	39.578	154	8.87	1
Nov. 5.2	22.100	159	75.52	111	36.073	282	84.13	126	61.963	123	72.81	75	39.424	125	8.88	8
15.2	21.941	129	74.41	148	35.791	243	82.87	176	61.840	93	72.06	96	39.299	93	8.80	17
25.1	21.812	92	72.93	182	35.548	195	81.11	220	61.747	57	71.10	116	39.206	51	8.63	25
Dec. 5.1	21.720	49	71.11	211	35.353	141	78.91	261	61.690	18	69.94	131	39.155	8	8.38	30
15.1	21.671	7	69.00	233	35.212	82	76.30	291	61.672	20	68.63	143	39.147	36	8.08	35
25.1	21.664	38	66.67	248	35.130	19	73.39	314	61.692	59	67.20	151	39.183	80	7.73	38
35.0	21.702		64.19		35.111		70.25		61.751		65.69		39.263		7.35	
Mean Place	20.007		56.96		35.322		61.31		59.182		59.58		35.806		11.96	
$\sec\delta$, $\tan\delta$	1.130		+0.527		1.608		+1.259		1.008		+0.126		1.104		−0.468	
$D_\psi \alpha$, $D_\omega \alpha$	+0.05		−0.01		+0.03		−0.03		+0.06		0.00		+0.07		+0.01	
$D_\psi \delta$, $D_\omega \delta$	+0.1		−0.9		+0.1		−0.9		+0.2		−0.9		+0.2		−0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	κ Aquilæ. Mag. 5.0				θ Cygni. Mag. 4.6				54 Sagittarii. Mag. 5.4				β Sagittæ. Mag. 4.4			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	19 32		− 7 12		19 34		+50 1		19 35		−16 29		19 37		+17 16	
	s		″		s		″		s		″		s		″	
Jan. 1.0	21.962		58.86		9.565		33.99		54.321		17.98		15.850		47.99	
11.0	22.058	96	59.55	69	9.581	16	30.83	316	54.421	100	18.11	13	15.919	69	45.95	204
21.0	22.189	131	60.22	67	9.657	76	27.62	321	54.556	135	18.19	8	16.027	108	43.90	205
31.0	22.353	164	60.82	60	9.793	136	24.48	314	54.726	170	18.22	3	16.168	141	41.97	193
Feb. 9.9	22.547	194	61.31	49	9.986	193	21.54	294	54.925	199	18.16	— 6	16.345	177	40.20	177
19.9	22.767	220	61.65	34	10.229	243	18.92	262	55.153	228	18.01	15	16.548	203	38.65	155
29.9	23.009	242	61.79	14	10.519	290	16.72	220	55.404	251	17.72	29	16.780	232	37.46	119
Mar. 10.8	23.272	263	61.74	— 5	10.847	328	15.02	170	55.674	270	17.31	41	17.034	254	36.64	82
20.8	23.549	277	61.44	30	11.207	360	13.90	112	55.962	288	16.74	57	17.309	275	36.25	39
30.8	23.840	291	60.92	52	11.590	383	13.41	49	56.264	302	16.02	72	17.597	288	36.29	— 4
Apr. 9.8	24.141	301	60.16	76	11.987	397	13.54	— 13	56.576	312	15.17	85	17.896	299	36.79	50
19.7	24.447	306	59.20	96	12.388	401	14.29	75	56.894	318	14.23	94	18.202	306	37.72	93
29.7	24.753	306	58.06	114	12.782	394	15.64	135	57.213	319	13.18	105	18.506	304	39.04	132
May 9.7	25.054	301	56.79	127	13.163	381	17.54	190	57.529	316	12.07	111	18.807	301	40.72	168
19.7	25.346	292	55.43	136	13.517	354	19.91	237	57.833	304	10.97	110	19.093	286	42.71	199
29.6	25.621	275	54.01	142	13.838	321	22.67	276	58.123	290	9.88	109	19.361	268	44.92	221
June 8.6	25.874	253	52.58	143	14.118	280	25.76	309	58.390	267	8.86	102	19.608	247	47.30	238
18.6	26.098	224	51.19	139	14.348	230	29.07	331	58.631	241	7.92	94	19.823	215	49.77	247
28.5	26.291	193	49.87	132	14.525	177	32.51	344	58.835	204	7.10	82	20.001	178	52.27	250
July 8.5	26.445	154	48.67	120	14.643	118	36.01	350	59.000	165	6.41	69	20.143	142	54.74	247
18.5	26.556	111	47.59	108	14.699	56	39.47	346	59.123	123	5.85	56	20.239	96	57.12	238
28.5	26.624	68	46.65	94	14.693	— 6	42.83	336	59.199	76	5.45	40	20.291	52	59.36	224
Aug. 7.4	26.647	23	45.87	78	14.626	67	45.99	316	59.230	31	5.19	26	20.297	6	61.41	205
17.4	26.626	— 21	45.25	62	14.501	125	48.89	290	59.213	— 17	5.05	14	20.260	— 37	63.25	184
27.4	26.564	62	44.78	47	14.322	179	51.49	260	59.155	58	5.03	2	20.184	76	64.81	156
Sept. 6.4	26.467	97	44.45	33	14.096	226	53.71	222	59.059	96	5.08	— 5	20.071	113	66.11	130
16.3	26.340	127	44.27	18	13.831	265	55.52	181	58.932	127	5.21	13	19.928	143	67.13	102
26.3	26.192	148	44.20	7	13.538	293	56.89	137	58.781	151	5.37	16	19.763	165	67.83	70
Oct. 6.3	26.031	161	44.24	— 4	13.225	313	57.78	89	58.617	164	5.56	19	19.586	177	68.20	37
16.2	25.867	164	44.38	14	12.905	320	58.16	38	58.449	168	5.76	20	19.405	181	68.28	8
26.2	25.710	157	44.62	24	12.591	314	58.02	— 14	58.287	162	5.95	19	19.229	176	68.02	— 26
Nov. 5.2	25.568	142	44.94	32	12.293	298	57.36	66	58.142	145	6.13	18	19.065	164	67.43	59
15.2	25.452	116	45.34	40	12.020	273	56.19	117	58.022	120	6.30	17	18.925	140	66.54	89
25.1	25.367	85	45.83	49	11.785	235	54.52	167	57.934	88	6.47	17	18.817	108	65.36	118
Dec. 5.1	25.316	51	46.38	55	11.594	191	52.39	213	57.883	51	6.62	15	18.742	75	63.90	146
15.1	25.305	11	47.00	62	11.456	138	49.87	252	57.871	12	6.77	15	18.703	39	62.20	170
25.1	25.334	— 29	47.67	67	11.373	83	47.03	284	57.901	— 30	6.91	14	18.705	— 2	60.32	188
35.0	25.403	69	48.37	70	11.350	23	43.95	308	57.973	72	7.04	13	18.746	41	58.33	199
Mean Place	22.409		54.00		11.354		33.80		54.728		12.42		16.549		50.45	
Sec δ, Tan δ	1.008		−0.127		1.557		+1.193		1.043		−0.296		1.047		+0.311	
$D_\psi a$, $D_\omega a$	+0.06		0.00		+0.03		−0.03		+0.07		+0.01		+0.05		−0.01	
$D_\psi \delta$, $D_\omega \delta$	+0.2		−0.9		+0.2		−0.9		+0.2		−0.9		+0.2		−0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	**15 Cygni.** Mag. 5.0				***f* Sagittarii.** Mag. 5.1				**γ Aquilæ.** Mag. 2.8				**δ Cygni.** Mag. 3.0			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	19 41		+37 8		19 41		−19 57		19 42		+10 24		19 42		+44 55	
	s		″		s		″		s		″		s		″	
Jan. 1.0	13.695		63.11		27.402		55.89		15.375		24.97		19.526		31.07	
		37		281		95		11		71		167		19		303
11.0	13.732		60.30		27.497		55.78		15.446		23.30		19.545		28.04	
		84		284		132		15		108		167		73		308
21.0	13.816		57.46		27.629		55.63		15.554		21.63		19.618		24.96	
		130		278		168		22		141		159		125		301
31.0	13.946		54.68		27.797		55.41		15.695		20.04		19.743		21.95	
		172		259		200		28		173		143		176		284
Feb. 9.9	14.118		52.09		27.997		55.13		15.868		18.61		19.919		19.11	
		213		230		226		37		202		120		222		254
19.9	14.331		49.79		28.223		54.76		16.070		17.41		20.141		16.57	
		247		191		252		47		226		93		264		213
29.9	14.578		47.88		28.475		54.29		16.296		16.48		20.405		14.44	
		278		145		273		58		248		58		301		166
Mar. 10.9	14.856		46.43		28.748		53.71		16.544		15.90		20.706		12.78	
		304		91		290		71		269		21		329		110
20.8	15.160		45.52		29.038		53.00		16.813		15.69	—	21.035		11.68	
		322		36		306		81		282		19		353		49
30.8	15.482		45.16	—	29.344		52.19		17.095		15.88		21.388		11.19	—
		336		22		317		90		294		58		366		11
Apr. 9.8	15.818		45.38		29.661		51.29		17.389		16.46		21.754		11.30	
		342		78		323		98		301		94		373		71
19.7	16.160		46.16		29.984		50.31		17.690		17.40		22.127		12.01	
		341		133		325		104		302		129		371		129
29.7	16.501		47.49		30.309		49.27		17.992		18.69		22.498		13.30	
		332		181		321		103		298		160		360		183
May 9.7	16.833		49.30		30.630		48.24		18.290		20.29		22.858		15.13	
		316		224		316		105		289		183		340		229
19.7	17.149		51.54		30.946		47.19		18.579		22.12		23.198		17.42	
		292		261		297		98		273		203		312		268
29.6	17.441		54.15		31.243		46.21		18.852		24.15		23.510		20.10	
		261		287		276		90		248		215		276		299
June 8.6	17.702		57.02		31.519		45.31		19.100		26.30		23.786		23.09	
		223		307		247		79		221		221		233		321
18.6	17.925		60.09		31.766		44.52		19.321		28.51		24.019		26.30	
		181		317		213		64		188		222		185		335
28.6	18.106		63.26		31.979		43.88		19.509		30.73		24.204		29.65	
		135		321		174		51		149		216		132		340
July 8.5	18.241		66.47		32.153		43.37		19.658		32.89		24.336		33.05	
		84		316		130		36		107		205		76		337
18.5	18.325		69.63		32.283		43.01		19.765		34.94		24.412		36.42	
		32		303		84		21		63		192		19		327
28.5	18.357	—	72.66		32.367		42.80		19.828		36.86		24.431	—	39.69	
		20		286		36		8		19		173		38		308
Aug. 7.4	18.337		75.52		32.403	—	42.72	—	19.847	—	38.59		24.393		42.77	
		69		260		11		5		25		154		93		284
17.4	18.268		78.12		32.392		42.77		19.822		40.13		24.300		45.61	
		116		233		55		14		65		131		144		254
27.4	18.152		80.45		32.337		42.91		19.757		41.44		24.156		48.15	
		156		197		93		22		101		106		187		219
Sept. 6.4	17.996		82.42		32.244		43.13		19.656		42.50		23.969		50.34	
		190		160		127		25		131		80		225		180
16.3	17.806		84.02		32.117		43.38		19.525		43.30		23.744		52.14	
		216		120		150		27		153		55		254		136
26.3	17.590		85.22		31.967		43.65		19.372		43.85		23.490		53.50	
		231		76		167		27		167		28		271		90
Oct. 6.3	17.359		85.98		31.800		43.92		19.205		44.13		23.219		54.40	
		238		32		171		24		171		3		279		43
16.3	17.121		86.30	—	31.629		44.16		19.034		44.16	—	22.940		54.83	—
		235		15		165		20		166		25		276		8
26.2	16.886		86.15		31.464		44.36		18.868		43.91		22.664		54.75	
		220		61		150		14		153		49		261		58
Nov. 5.2	16.666		85.54		31.314		44.50		18.715		43.42		22.403		54.17	
		198		107		125		9		131		76		239		108
15.2	16.468		84.47		31.189		44.59		18.584		42.66		22.164		53.09	
		166		150		96		5		102		99		206		156
25.1	16.302		82.97		31.093		44.64		18.482		41.67		21.958		51.53	
		130		189		57		1		69		121		165		199
Dec. 5.1	16.172		81.08		31.036		44.65	—	18.413		40.46		21.793		49.54	
		87		225		17 —		3		33 —		140		120		238
15.1	16.085		78.83		31.019		44.62		18.380		39.06		21.673		47.16	
		42		254		26		6		7		155		69		271
25.1	16.043	—	76.29		31.045		44.56		18.387		37.51		21.604		44.45	
		6		273		67		9		44		164		16		291
35.0	16.049		73.56		31.112		44.47		18.431		35.87		21.588		41.54	
Mean Place	14.869		63.39		27.794		50.06		15.965		27.84		21.021		30.53	
Sec δ, Tan δ	1.255		+0.758		1.064		−0.363		1.017		+0.184		1.412		+0.997	
Dψ α, Dω α	+0.04		−0.02		+0.07		+0.01		+0.06		−0.01		+0.04		−0.03	
Dψ δ, Dω δ	+0.2		−0.9		+0.2		−0.9		+0.2		−0.9		+0.2		−0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	**δ Sagittæ.** Mag. 3.8				**α Aquilæ.** (*Altair.*) Mag. 0.9			
	Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′	
	19 43		+18 19		19 46		+ 8 38	
	s		″		s		″	
Jan. 1.0	37.834	62	32.86	206	40.533	72	41.23	155
11.0	37.896	98	30.80	207	40.605	108	39.68	155
21.0	37.994	136	28.73	199	40.713	141	38.13	146
31.0	38.130	170	26.74	183	40.854	174	36.67	131
Feb. 9.9	38.300	200	24.91	157	41.028	201	35.36	108
19.9	38.500	226	23.34	125	41.229	226	34.28	81
29.9	38.726	251	22.09	87	41.455	249	33.47	50
Mar. 10.9	38.977	271	21.22	44	41.704	268	32.97	12
20.8	39.248	287	20.78	0	41.972	282	32.85	— 25
30.8	39.535	299	20.78	47	42.254	294	33.10	62
Apr. 9.8	39.834	306	21.25	91	42.548	301	33.72	99
19.7	40.140	308	22.16	132	42.849	303	34.71	130
29.7	40.448	301	23.48	168	43.152	300	36.01	160
May 9.7	40.749	292	25.16	200	43.452	289	37.61	182
19.7	41.041	274	27.16	222	43.741	275	39.43	200
29.6	41.315	250	29.38	241	44.016	252	41.43	212
June 8.6	41.565	220	31.79	252	44.268	223	43.55	216
18.6	41.785	186	34.31	255	44.491	192	45.71	215
28.6	41.971	145	36.86	253	44.683	152	47.86	209
July 8.5	42.116	103	39.39	244	44.835	111	49.95	199
18.5	42.219	58	41.83	231	44.946	67	51.94	185
28.5	42.277	11	44.14	212	45.013	22	53.79	165
Aug. 7.4	42.288	— 32	46.26	190	45.035	— 20	55.44	147
17.4	42.256	74	48.16	165	45.015	61	56.91	123
27.4	42.182	110	49.81	138	44.954	97	58.14	100
Sept. 6.4	42.072	140	51.19	107	44.857	127	59.14	75
16.3	41.932	164	52.26	76	44.730	149	59.89	51
26.3	41.768	177	53.02	45	44.581	164	60.40	25
Oct. 6.3	41.591	183	53.47	12	44.417	167	60.65	2
16.3	41.408	178	53.59	— 22	44.250	163	60.67	— 25
26.2	41.230	164	53.37	54	44.087	150	60.42	47
Nov. 5.2	41.066	144	52.83	87	43.937	127	59.95	72
15.2	40.922	115	51.96	118	43.810	101	59.23	93
25.1	40.807	81	50.78	144	43.709	67	58.30	114
Dec. 5.1	40.726	45	49.34	170	43.642	31	57.16	130
15.1	40.681	6	47.64	189	43.611	— 8	55.86	143
25.1	40.675	— 35	45.75	201	43.619	45	54.43	153
35.0	40.710		43.74		43.664		52.90	
Mean Place	38.540		34.84		41.097		44.21	
Sec δ, Tan δ	1.053		+0.331		1.012		+0.152	
$D_\psi a$, $D_\omega a$	+0.05		−0.01		+0.06		0.00	
$D_\psi \delta$, $D_\omega \delta$	+0.2		−0.9		+0.2		−0.9	

Washington Mean Time.	**η Aquilæ.** Var. 3.7–4.4				**ε Draconis.** Mag. 4.0			
	Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′	
	19 48		+ 0 47		19 48		+70 2	
	s		″		s		″	
Jan. 1.0	11.187	73	17.57	113	23.64	14	77.33	325
11.0	11.260	110	16.44	110	23.50	0	74.08	338
21.0	11.370	141	15.34	103	23.50	10	70.70	337
31.0	11.511	173	14.31	89	23.60	22	67.33	323
Feb. 9.9	11.684	201	13.42	71	23.82	34	64.10	297
19.9	11.885	224	12.71	48	24.16	44	61.13	258
29.9	12.109	246	12.23	20	24.60	52	58.55	210
Mar. 10.9	12.355	266	12.03	— 9	25.12	59	56.45	153
20.8	12.621	281	12.12	39	25.71	64	54.92	91
30.8	12.902	292	12.51	70	26.35	68	54.01	27
Apr. 9.8	13.194	300	13.21	98	27.03	68	53.74	— 39
19.7	13.494	303	14.19	125	27.71	67	54.13	103
29.7	13.797	300	15.44	145	28.38	64	55.16	162
May 9.7	14.097	293	16.89	163	29.02	59	56.78	216
19.7	14.390	278	18.52	174	29.61	53	58.94	262
29.6	14.668	256	20.26	180	30.14	45	61.56	301
June 8.6	14.924	231	22.06	181	30.59	34	64.57	330
18.6	15.155	198	23.87	178	30.93	25	67.87	351
28.6	15.353	161	25.65	169	31.18	14	71.38	363
July 8.5	15.514	119	27.34	157	31.32	4	75.01	366
18.5	15.633	77	28.91	143	31.36	— 9	78.67	360
28.5	15.710	32	30.34	125	31.27	18	82.27	347
Aug. 7.4	15.742	— 12	31.59	108	31.09	29	85.74	326
17.4	15.730	52	32.67	87	30.80	39	89.00	298
27.4	15.678	89	33.54	67	30.41	47	91.98	264
Sept. 6.4	15.589	120	34.21	49	29.94	54	94.62	225
16.3	15.469	142	34.70	29	29.40	60	96.87	181
26.3	15.327	158	34.99	11	28.80	63	98.68	132
Oct. 6.3	15.169	163	35.10	— 6	28.17	66	100.00	80
16.3	15.006	158	35.04	25	27.51	67	100.80	26
26.2	14.848	147	34.79	40	26.84	65	101.06	— 31
Nov. 5.2	14.701	124	34.39	57	26.19	61	100.75	87
15.2	14.577	97	33.82	71	25.58	56	99.88	143
25.1	14.480	64	33.11	85	25.02	50	98.45	195
Dec. 5.1	14.416	28	32.26	96	24.52	41	96.50	241
15.1	14.388	— 11	31.30	106	24.11	31	94.09	280
25.1	14.399	47	30.24	111	23.80	21	91.29	312
35.0	14.446		29.13		23.59		88.17	
Mean Place	11.663		21.24		27.939		74.24	
Sec δ, Tan δ	1.000		+0.014		2.932		+2.756	
$D_\psi a$, $D_\omega a$	+0.06		0.00		0.00		−0.08	
$D_\psi \delta$, $D_\omega \delta$	+0.2		−0.9		+0.2		−0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	**ι Sagittarii.** Mag. 4.2				**ε Pavonis.** Mag. 4.1				**β Aquilæ.** Mag. 3.9				**γ Sagittæ.** Mag. 3.7			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	19 49		−42 5		19 50		−73 7		19 51		+ 6 11		19 55		+19 15	
	s		″		s		″		s		″		s		″	
Jan. 1.1	27.587		31.57		51.70		69.75		10.704		43.26		0.562		46.57	
11.0	27.687	100	30.08	149	51.81	11	66.69	306	10.770	66	41.83	143	0.610	48	44.51	206
21.0	27.836	149	28.53	155	52.06	25	63.59	310	10.872	102	40.41	142	0.698	88	42.43	208
31.0	28.030	194	26.95	158	52.44	38	60.52	307	11.007	135	39.06	135	0.822	124	40.42	201
Feb. 9.9	28.265	235	25.37	158	52.93	49	57.54	298	11.174	167	37.86	120	0.980	158	38.56	186
19.9	28.537	272	23.80	157	53.53	60	54.74	280	11.369	195	36.86	100	1.168	188	36.94	162
29.9	28.842	305	22.28	152	54.22	69	52.17	257	11.590	221	36.12	74	1.387	219	35.64	130
Mar. 10.9	29.174	332	20.82	146	54.99	77	49.87	230	11.832	242	35.68	44	1.630	243	34.71	93
20.8	29.531	357	19.44	138	55.82	83	47.89	198	12.095	263	35.59	9	1.896	266	34.21	50
30.8	29.905	374	18.15	129	56.70	88	46.28	161	12.374	279	35.85	26	2.180	284	34.16	5
Apr. 9.8	30.295	390	17.00	115	57.62	92	45.04	124	12.665	291	36.47	62	2.477	297	34.57	41
19.7	30.695	400	16.00	100	58.55	93	44.22	82	12.965	300	37.41	94	2.785	308	35.44	87
29.7	31.097	402	15.16	84	59.48	93	43.82	40	13.268	303	38.68	127	3.094	309	36.72	128
May 9.7	31.496	399	14.53	63	60.38	90	43.82	0	13.568	300	40.20	152	3.400	306	38.38	166
19.7	31.885	389	14.10	43	61.26	88	44.27	45	13.860	292	41.94	174	3.698	298	40.37	199
29.6	32.255	370	13.91	19	62.08	82	45.12	85	14.139	279	43.83	189	3.980	282	42.60	223
June 8.6	32.598	343	13.94	3	62.83	75	46.37	125	14.395	256	45.83	200	4.238	258	45.02	242
18.6	32.907	309	14.22	28	63.50	67	47.98	161	14.625	230	47.86	203	4.469	231	47.58	256
28.6	33.175	268	14.72	50	64.04	54	49.89	191	14.822	197	49.89	203	4.664	195	50.18	260
July 8.5	33.394	219	15.44	72	64.48	44	52.07	218	14.982	160	51.86	197	4.820	156	52.76	258
18.5	33.559	165	16.33	89	64.79	31	54.43	236	15.100	118	53.72	186	4.933	113	55.27	251
28.5	33.667	108	17.37	104	64.96	17	56.92	249	15.175	75	55.42	170	5.001	68	57.66	239
Aug. 7.4	33.714	47	18.52	115	64.97	1	59.44	252	15.206	31	56.96	154	5.023	22	59.86	220
17.4	33.703	11	19.72	120	64.86	11	61.90	246	15.193	13	58.30	134	5.000	23	61.86	200
27.4	33.636	67	20.92	120	64.61	25	64.23	233	15.138	55	59.43	113	4.935	65	63.60	174
Sept. 6.4	33.519	117	22.04	112	64.22	39	66.30	207	15.048	90	60.34	91	4.832	103	65.07	147
16.3	33.360	159	23.06	102	63.74	48	68.06	176	14.926	122	61.01	67	4.698	134	66.24	117
26.3	33.168	192	23.91	85	63.18	56	69.42	136	14.782	144	61.46	45	4.529	159	67.09	85
Oct. 6.3	32.952	216	24.55	64	62.55	63	70.31	89	14.623	159	61.67	21	4.365	174	67.63	54
16.3	32.728	224	24.94	39	61.90	65	70.70	39	14.457	166	61.67	0	4.183	182	67.83	20
26.2	32.508	220	25.05	11	61.24	66	70.56	14	14.295	162	61.43	24	4.004	179	67.68	15
Nov. 5.2	32.305	203	24.88	17	60.62	62	69.87	69	14.145	150	60.98	45	3.837	167	67.21	47
15.2	32.130	175	24.43	45	60.05	57	68.65	122	14.017	128	60.31	67	3.689	148	66.41	80
25.1	31.992	138	23.72	71	59.56	49	66.95	170	13.914	103	59.45	86	3.567	122	65.28	113
Dec. 5.1	31.900	92	22.78	94	59.20	36	64.81	214	13.844	70	58.41	104	3.476	91	63.88	140
15.1	31.858	42	21.63	115	58.95	25	62.30	251	13.810	34	57.20	121	3.422	54	62.21	167
25.1	31.868	10	20.32	131	58.83	12	59.52	278	13.812	2	55.87	133	3.406	16	60.35	186
35.0	31.929	61	18.89	143	58.84	1	56.53	299	13.853	41	54.47	140	3.429	23	58.35	200
Mean Place	28.069		23.95		53.723		60.88		11.228		46.21		1.264		47.78	
Sec δ, Tan δ	1.348		−0.903		3.446		−3.298		1.006		+0.108		1.060		+0.350	
$D_\psi \alpha$, $D_\omega \alpha$	+0.08		+0.03		+0.14		+0.10		+0.06		0.00		+0.05		−0.01	
$D_\psi \delta$, $D_\omega \delta$	+0.2		−0.9		+0.2		−0.9		+0.2		−0.9		+0.2		−0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	*c* **Sagittarii.** Mag. 4.6				*τ* **Aquilæ.** Mag. 5.6				*θ* **Aquilæ.** Mag. 3.4				*o* **Cygni** *seq.* Mag. 4.0			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 19 57		° ′ −27 56		h m 20 0		° ′ + 7 2		h m 20 6		° ′ − 1 4		h m 20 10		° ′ +46 28	
	s		″		s		″		s		″		s		″	
Jan. 1.1	29.353		46.08		1.688		22.82		57.853		20.33		57.734		73.18	
11.0	29.436	83	45.44	64	1.743	55	21.39	143	57.911	58	21.30	97	57.712	22	70.27	291
21.0	29.559	123	44.73	71	1.837	94	19.96	143	58.002	91	22.24	94	57.745	33	67.25	302
31.0	29.719	160	43.96	77	1.962	125	18.61	135	58.128	126	23.11	87	57.831	86	64.22	303
Feb. 10.0	29.913	194	43.14	82	2.120	158	17.39	122	58.284	156	23.85	74	57.970	139	61.31	291
19.9	30.139	226	42.25	89	2.308	188	16.38	101	58.468	184	24.42	57	58.159	189	58.64	267
29.9	30.393	254	41.31	94	2.521	213	15.62	76	58.679	211	24.77	35	58.395	236	56.33	231
Mar. 10.9	30.670	277	40.30	101	2.759	238	15.17	45	58.913	234	24.87	10	58.674	279	54.45	188
20.8	30.969	299	39.25	105	3.018	259	15.05	12	59.169	256	24.69	18	58.990	316	53.10	135
30.8	31.285	316	38.16	109	3.294	276	15.30	25	59.442	273	24.22	47	59.335	345	52.32	78
Apr. 9.8	31.615	330	37.05	111	3.581	287	15.91	61	59.730	288	23.46	76	59.701	366	52.14	18
19.8	31.956	341	35.95	110	3.881	300	16.87	96	60.029	299	22.44	102	60.082	381	52.58	44
29.7	32.301	345	34.88	107	4.184	303	18.14	127	60.335	306	21.16	128	60.466	384	53.60	102
May 9.7	32.646	345	33.87	101	4.488	304	19.67	153	60.640	305	19.70	146	60.846	380	55.17	157
19.7	32.984	338	32.95	92	4.783	295	21.45	178	60.941	301	18.07	163	61.212	366	57.25	208
29.7	33.308	324	32.15	80	5.064	281	23.39	194	61.230	289	16.34	173	61.554	342	59.76	251
June 8.6	33.610	302	31.51	64	5.325	261	25.43	204	61.500	270	14.56	178	61.863	309	62.62	286
18.6	33.885	275	31.03	48	5.561	236	27.55	212	61.745	245	12.78	178	62.133	270	65.76	314
28.6	34.125	240	30.73	30	5.765	204	29.63	208	61.960	215	11.05	173	62.356	223	69.09	333
July 8.5	34.326	201	30.61	12	5.931	166	31.67	204	62.138	178	9.41	164	62.527	171	72.52	343
18.5	34.480	154	30.67	6	6.057	126	33.60	193	62.277	139	7.89	152	62.641	114	75.97	345
28.5	34.585	105	30.90	23	6.139	82	35.40	180	62.372	95	6.51	138	62.697	56	79.37	340
Aug. 7.5	34.640	55	31.26	36	6.179	40	37.02	162	62.422	50	5.32	119	62.693	4	82.63	326
17.4	34.645	5	31.73	47	6.173	6	38.43	141	62.428	6	4.31	101	62.633	60	85.69	306
27.4	34.601	44	32.28	55	6.127	46	39.64	121	62.392	36	3.48	83	62.518	115	88.50	281
Sept. 6.4	34.513	88	32.87	59	6.040	87	40.64	100	62.317	75	2.86	62	62.354	164	90.98	248
16.4	34.389	124	33.46	59	5.924	116	41.38	74	62.209	108	2.41	45	62.148	206	93.09	211
26.3	34.236	153	34.01	55	5.784	140	41.89	51	62.077	132	2.15	26	61.910	238	94.80	171
Oct. 6.3	34.064	172	34.48	47	5.626	158	42.16	27	61.927	150	2.05	10	61.646	264	96.06	126
16.3	33.883	181	34.85	37	5.463	163	42.22	6	61.769	158	2.12	7	61.369	277	96.84	78
26.2	33.705	178	35.08	23	5.301	162	42.03	19	61.612	157	2.35	23	61.088	281	97.12	28
Nov. 5.2	33.541	164	35.19	11	5.150	151	41.61	42	61.465	147	2.71	36	60.815	273	96.90	22
15.2	33.398	143	35.15	4	5.018	132	40.97	64	61.336	129	3.21	50	60.560	255	96.17	73
25.2	33.287	111	34.96	19	4.913	105	40.13	84	61.232	104	3.83	62	60.330	230	94.93	124
Dec. 5.1	33.213	74	34.66	30	4.836	77	39.10	103	61.159	73	4.58	75	60.136	194	93.22	171
15.1	33.180	33	34.24	42	4.794	42	37.91	119	61.119	40	5.42	84	59.983	153	91.08	214
25.1	33.189	9	33.73	51	4.788	6	36.57	134	61.114	5	6.33	91	59.876	107	88.57	251
35.1	33.242	53	33.13	60	4.819	31	35.19	138	61.147	33	7.29	96	59.821	55	85.80	277
Mean Place	29.714		39.49		2.205		25.31		58.275		17.03		59.242		69.86	
Sec δ, Tan δ	1.132		−0.530		1.008		+0.124		1.000		−0.019		1.453		+1.054	
$D_\psi a$, $D_\omega a$	+0.07		+0.02		+0.06		0.00		+0.06		0.00		+0.04		−0.04	
$D_\psi \delta$, $D_\omega \delta$	+0.2		−0.9		+0.2		−0.9		+0.2		−0.9		+0.2		−0.8	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	κ Cephei. Mag. 4.4				24 Vulpeculæ. Mag. 5.4				α^2 Capricorni. Mag. 3.8				β Capricorni. Mag. 3.2			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	20 11		+77 27		20 13		+24 24		20 13		−12 48		20 16		−15 2	
	s		″		s		″		s		″		s		″	
Jan. 1.1	37.36		38.38		10.677		42.62		23.381		26.33		17.309		55.76	
		38		306		25		221		59		26		57		12
11.0	36.98		35.32		10.702		40.41		23.440		26.59		17.366		55.88	
		18		325		63		226		93		22		92		6
21.0	36.80		32.07		10.765		38.15		23.533		26.81		17.458		55.94	—
		0		333		102		222		128		13		127		2
31.0	36.80		28.74		10.867		35.93		23.661		26.94		17.585		55.92	
		20		327		137		208		160		2		159		12
Feb. 10.0	37.00		25.47		11.004		33.85		23.821		26.96	—	17.744		55.80	
		38		308		173		186		188		11		187		26
19.9	37.38		22.39		11.177		31.99		24.009		26.85		17.931		55.54	
		55		277		205		155		215		27		215		40
29.9	37.93		19.62		11.382		30.44		24.224		26.58		18.146		55.14	
		72		235		233		116		239		44		239		56
Mar. 10.9	38.65		17.27		11.615		29.28		24.463		26.14		18.385		54.58	
		83		185		260		73		261		64		262		73
20.8	39.48		15.42		11.875		28.55		24.724		25.50		18.647		53.85	
		93		126		282		24		279		82		281		89
30.8	40.41		14.16		12.157		28.31	—	25.003		24.68		18.928		52.96	
		100		64		300		24		296		98		298		104
Apr. 9.8	41.41		13.52	—	12.457		28.55		25.299		23.70		19.226		51.92	
		102		1		311		72		308		115		310		117
19.8	42.43		13.53		12.768		29.27		25.607		22.55		19.536		50.75	
		103		64		318		119		315		127		317		127
29.7	43.46		14.17		13.086		30.46		25.922		21.28		19.853		49.48	
		98		125		317		162		317		135		320		134
May 9.7	44.44		15.42		13.403		32.08		26.239		19.93		20.173		48.14	
		93		180		309		198		313		141		317		136
19.7	45.37		17.22		13.712		34.06		26.552		18.52		20.490		46.78	
		83		232		296		228		302		140		305		135
29.7	46.20		19.54		14.008		36.34		26.854		17.12		20.795		45.43	
		71		275		275		254		286		136		290		129
June 8.6	46.91		22.29		14.283		38.88		27.140		15.76		21.085		44.14	
		56		310		245		269		261		129		265		119
18.6	47.47		25.39		14.528		41.57		27.401		14.47		21.350		42.95	
		43		336		212		278		231		117		236		108
28.6	47.90		28.75		14.740		44.35		27.632		13.30		21.586		41.87	
		26		356		171		281		194		104		200		93
July 8.5	48.16		32.31		14.911		47.16		27.826		12.26		21.786		40.94	
		8		364		128		277		153		88		158		75
18.5	48.24	—	35.95		15.039		49.93		27.979		11.38		21.944		40.19	
		8		365		82		266		109		70		113		59
28.5	48.16		39.60		15.121		52.59		28.088		10.68		22.057		39.60	
		24		359		35		250		63		54		67		42
Aug. 7.5	47.92		43.19		15.156	—	55.09		28.151		10.14		22.124		39.18	
		42		343		11		230		17		37		21		24
17.4	47.50		46.62		15.145		57.39		28.168	—	9.77		22.145	—	38.94	
		56		322		56		204		27		21		24		10
27.4	46.94		49.84		15.089		59.43		28.141		9.56		22.121		38.84	—
		69		294		96		176		68		8		66		3
Sept. 6.4	46.25		52.78		14.993		61.19		28.073		9.48	—	22.055		38.87	
		82		259		130		146		102		3		100		13
16.4	45.43		55.37		14.863		62.65		27.971		9.51		21.955		39.00	
		92		218		158		113		130		13		129		22
26.3	44.51		57.55		14.705		63.78		27.841		9.64		21.826		39.22	
		99		174		177		77		148		20		148		26
Oct. 6.3	43.52		59.29		14.528		64.55		27.693		9.84		21.678		39.48	
		104		125		186		40		159		26		159		30
16.3	42.48		60.54		14.342		64.95		27.534		10.10		21.519		39.78	
		107		71		187		3		158		28		160		30
26.2	41.41		61.25		14.155		64.98	—	27.376		10.38		21.359		40.08	
		107		16		180		34		149		31		151		30
Nov. 5.2	40.34		61.41	—	13.975		64.64		27.227		10.69		21.208		40.38	
		103		42		162		72		131		31		134		29
15.2	39.31		60.99		13.813		63.92		27.096		11.00		21.074		40.67	
		98		99		141		108		106		33		108		27
25.2	38.33		60.00		13.672		62.84		26.990		11.33		20.966		40.94	
		90		154		110		140		75		32		78		24
Dec. 5.1	37.43		58.46		13.562		61.44		26.915		11.65		20.888		41.18	
		77		205		76		171		40		33		44		22
15.1	36.66		56.41		13.486		59.73		26.875		11.98		20.844		41.40	
		64		250		40		195		5		31		6		19
25.1	36.02		53.91		13.446		57.78		26.870	—	12.29		20.838	—	41.59	
		48		287		3		214		33		28		31		15
35.1	35.54		51.04		13.443		55.64		26.903		12.57		20.869		41.74	
Mean Place	44.499		32.26		11.441		42.01		23.716		21.57		17.627		50.73	
Sec δ, Tan δ	4.606		+4.496		1.098		+0.454		1.026		−0.227		1.035		−0.269	
$D_\psi a$, $D_\omega a$	−0.04		−0.16		+0.05		−0.02		+0.07		+0.01		+0.07		+0.01	
$D_\psi \delta$, $D_\omega \delta$	+0.2		−0.8		+0.2		−0.8		+0.2		−0.8		+0.2		−0.8	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Pavonis. Mag. 2.1				γ Cygni. Mag. 2.3				π Capricorni. Mag. 5.2				ρ Capricorni. Mag. 5.0			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	20 18		−57 0		20 19		+39 58		20 22		−18 29		20 24		−18 5	
	s		″		s		″		s		″		s		″	
Jan. 1.1	59.913		28.70		11.602		77.26		30.585		21.43		3.979		37.17	
11.0	59.966	53	26.40	230	11.588	14 —	74.55	271	30.638	53	21.33	10	4.029	50	37.10	7
21.0	60.086	120	23.97	243	11.623	35	71.74	281	30.724	86	21.17	16	4.115	86	36.94	16
31.0	60.271	185	21.47	250	11.705	82	68.92	282	30.847	123	20.91	26	4.236	121	36.71	23
Feb. 10.0	60.516	245	18.96	251	11.834	129	66.20	272	31.003	156	20.54	37	4.389	153	36.37	34
19.9	60.817	301	16.50	246	12.006	172	63.73	247	31.188	185	20.07	47	4.573	184	35.91	46
29.9	61.168	351	14.12	238	12.221	215	61.58	215	31.401	213	19.46	61	4.784	211	35.32	59
Mar. 10.9	61.563	395	11.88	224	12.473	252	59.84	174	31.641	240	18.73	73	5.020	236	34.58	74
20.9	61.998	435	9.82	206	12.758	285	58.60	124	31.902	261	17.84	89	5.282	262	33.71	87
30.8	62.464	466	7.96	186	13.072	314	57.90	70	32.188	286	16.82	102	5.562	280	32.69	102
Apr. 9.8	62.957	493	6.36	160	13.408	336	57.78	12 —	32.488	300	15.67	115	5.862	300	31.55	114
19.8	63.468	511	5.02	134	13.759	351	58.25	47	32.800	312	14.44	123	6.174	312	30.31	124
29.7	63.990	522	3.99	103	14.115	356	59.26	101	33.122	322	13.14	130	6.495	321	29.00	131
May 9.7	64.514	524	3.29	70	14.470	355	60.81	155	33.449	327	11.79	135	6.820	325	27.66	134
19.7	65.030	516	2.94	35	14.815	345	62.82	201	33.774	325	10.47	132	7.143	323	26.32	134
29.7	65.526	496	2.93	1 —	15.143	328	65.25	243	34.088	314	9.21	126	7.458	315	25.02	130
June 8.6	65.993	467	3.28	35	15.443	300	68.01	276	34.385	297	8.01	120	7.755	297	23.81	121
18.6	66.418	425	3.97	69	15.708	265	71.03	302	34.659	274	6.94	107	8.030	275	22.71	110
28.6	66.791	373	4.99	102	15.933	225	74.23	320	34.905	246	6.01	93	8.275	245	21.75	96
July 8.6	67.105	314	6.29	130	16.112	179	77.51	328	35.112	207	5.26	75	8.483	208	20.96	79
18.5	67.349	244	7.85	156	16.240	128	80.82	331	35.278	166	4.68	58	8.651	168	20.36	60
28.5	67.519	170	9.61	176	16.315	75	84.06	324	35.402	124	4.28	40	8.774	123	19.93	43
Aug. 7.5	67.610	91	11.49	188	16.336	21 —	87.16	310	35.475	73	4.06	22	8.850	76	19.69	24
17.4	67.622	12 —	13.43	194	16.304	32	90.08	292	35.502	27 —	4.00	6 —	8.879	29 —	19.60	9 —
27.4	67.557	65	15.36	193	16.221	83	92.75	267	35.484	18	4.09	9	8.861	18	19.66	6
Sept. 6.4	67.419	138	17.19	183	16.093	128	95.11	236	35.422	62	4.28	19	8.801	60	19.84	18
16.4	67.218	201	18.85	166	15.924	169	97.12	201	35.323	99	4.57	29	8.706	95	20.13	29
26.3	66.965	253	20.27	142	15.724	200	98.74	162	35.197	126	4.91	34	8.579	127	20.46	33
Oct. 6.3	66.673	292	21.37	110	15.502	222	99.94	120	35.048	149	5.29	38	8.431	148	20.83	37
16.3	66.358	315	22.10	73	15.265	237	100.70	76	34.886	162	5.67	38	8.272	159	21.19	36
26.3	66.037	321	22.43	33 —	15.025	240	100.99	29 —	34.725	161	6.01	34	8.111	161	21.54	35
Nov. 5.2	65.727	310	22.34	9	14.790	235	100.80	19	34.570	155	6.31	30	7.956	155	21.85	31
15.2	65.443	284	21.81	53	14.572	218	100.14	66	34.434	136	6.55	24	7.818	138	22.11	26
25.2	65.199	244	20.87	94	14.376	196	99.00	114	34.321	113	6.73	18	7.705	113	22.31	20
Dec. 5.1	65.007	192	19.53	134	14.211	165	97.42	158	34.238	83	6.88	15	7.621	84	22.46	15
15.1	64.876	131	17.85	168	14.084	127	95.44	198	34.189	49	6.96	8	7.571	50	22.56	10
25.1	64.810	66 —	15.89	196	13.997	87	93.13	231	34.177	12 —	6.96	0	7.558	13 —	22.59	3 —
35.1	64.815	5	13.69	220	13.955	42	90.53	260	34.203	26	6.90	6	7.581	23	22.56	3
Mean Place	60.575		19.20		12.795		74.03		30.878		15.96		4.266		31.78	
Sec δ, Tan δ	1.836		−1.540		1.305		+0.839		1.054		−0.334		1.052		−0.327	
Dψ α, Dω α	+0.09		+0.06		+0.04		−0.03		+0.07		+0.01		+0.07		+0.01	
Dψ δ, Dω δ	+0.2		−0.8		+0.2		−0.8		+0.2		−0.8		+0.2		−0.8	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	41 Cygni. Mag. 4.1				θ Cephei. Mag. 4.3				ε Delphini. Mag. 4.0				Groombridge 3241. Mag. 6.4			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	20 25		+30 5		20 28		+62 42		20 29		+11 0		20 30		+72 14	
	s		″		s		″		s		″		s		″	
Jan. 1.1	56.983	2	17.90	237	7.73	13	47.95	300	11.516	26	60.71	154	18.09	28	57.62	299
11.0	56.985	43	15.53	245	7.60	6 —	44.95	320	11.542	61	59.17	155	17.81	15	54.63	319
21.0	57.028	83	13.08	242	7.54	3	41.75	328	11.603	94	57.62	151	17.66	2 —	51.44	332
31.0	57.111	123	10.66	234	7.57	11	38.47	323	11.697	128	56.11	139	17.64	11	48.12	329
Feb. 10.0	57.234	160	8.32	211	7.68	20	35.24	305	11.825	159	54.72	118	17.75	25	44.83	315
19.9	57.394	196	6.21	180	7.88	28	32.19	275	11.984	187	53.54	95	18.00	37	41.68	287
29.9	57.590	229	4.41	143	8.16	36	29.44	234	12.171	215	52.59	62	18.37	48	38.81	247
Mar. 10.9	57.819	259	2.98	96	8.52	41	27.10	184	12.386	240	51.97	26 —	18.85	58	36.34	199
20.9	58.078	285	2.02	48 —	8.93	46	25.26	126	12.626	263	51.71	11	19.43	65	34.35	141
30.8	58.363	306	1.54	6	9.39	50	24.00	64	12.889	280	51.82	48	20.08	72	32.94	80
Apr. 9.8	58.669	320	1.60	57	9.89	52	23.36	0	13.169	295	52.30	88	20.80	75	32.14	19 —
19.8	58.989	329	2.17	107	10.41	54	23.36	64	13.464	306	53.18	123	21.55	75	31.95	47
29.7	59.318	330	3.24	154	10.95	53	24.00	125	13.770	308	54.41	155	22.30	75	32.42	108
May 9.7	59.648	323	4.78	195	11.48	51	25.25	181	14.078	305	55.96	181	23.05	71	33.50	168
19.7	59.971	310	6.73	233	11.99	47	27.06	233	14.383	296	57.77	204	23.76	66	35.18	221
29.7	60.281	289	9.06	260	12.46	42	29.39	276	14.679	279	59.81	218	24.42	58	37.39	265
June 8.6	60.570	260	11.66	281	12.88	36	32.15	312	14.958	256	61.99	227	25.00	49	40.04	303
18.6	60.830	226	14.47	295	13.24	30	35.27	338	15.214	225	64.26	231	25.49	39	43.07	334
28.6	61.056	184	17.42	300	13.54	22	38.65	359	15.439	192	66.57	227	25.88	28	46.41	354
July 8.6	61.240	139	20.42	300	13.76	14	42.24	367	15.631	150	68.84	220	26.16	15	49.95	368
18.5	61.379	91	23.42	292	13.90	6 —	45.91	369	15.781	108	71.04	207	26.31	4 —	53.63	372
28.5	61.470	43 —	26.34	278	13.96	2	49.60	362	15.889	62	73.11	191	26.35	9	57.35	367
Aug. 7.5	61.513	7	29.12	258	13.94	12	53.22	347	15.951	18 —	75.02	170	26.26	20	61.02	356
17.4	61.506	52	31.70	235	13.82	18	56.69	326	15.969	25	76.72	150	26.06	32	64.58	336
27.4	61.454	95	34.05	205	13.64	26	59.95	297	15.944	65	78.22	125	25.74	42	67.94	310
Sept. 6.4	61.359	131	36.10	174	13.38	32	62.92	262	15.879	99	79.47	100	25.32	51	71.04	278
16.4	61.228	162	37.84	139	13.06	37	65.54	223	15.780	127	80.47	74	24.81	59	73.82	239
26.3	61.066	185	39.23	101	12.69	41	67.77	177	15.653	147	81.21	48	24.22	65	76.21	194
Oct. 6.3	60.881	195	40.24	61	12.28	44	69.54	128	15.506	158	81.69	22 —	23.57	70	78.15	147
16.3	60.686	201	40.85	21 —	11.84	46	70.82	75	15.348	162	81.91	5	22.87	72	79.62	92
26.3	60.485	194	41.06	21	11.38	45	71.57	20	15.186	156	81.86	31	22.15	73	80.54	37 —
Nov. 5.2	60.291	181	40.85	62	10.93	44	71.77	37	15.030	142	81.55	56	21.42	71	80.91	21
15.2	60.110	159	40.23	101	10.49	41	71.40	94	14.888	121	80.99	81	20.71	68	80.70	79
25.2	59.951	131	39.22	142	10.08	37	70.46	148	14.767	95	80.18	102	20.03	62	79.91	136
Dec. 5.1	59.820	98	37.80	175	9.71	32	68.98	200	14.672	65	79.16	122	19.41	55	78.55	189
15.1	59.722	63	36.05	203	9.39	26	66.98	245	14.607	32 —	77.94	138	18.86	46	76.66	236
25.1	59.659	24	34.02	226	9.13	19	64.53	280	14.575	2	76.56	149	18.40	35	74.30	279
35.1	59.635		31.76		8.94		61.73		14.577		75.07		18.05		71.51	
Mean Place	57.846		15.56		10.504		41.18		12.011		61.28		22.763		49.78	
Sec δ, Tan δ	1.156		+0.579		2.181		+1.939		1.019		+0.195		3.280		+3.124	
$D_\psi \alpha$, $D_\omega \alpha$	+0.05		−0.02		+0.02		−0.08		+0.06		−0.01		0.00		−0.13	
$D_\psi \delta$, $D_\omega \delta$	+0.2		−0.8		+0.2		−0.8		+0.2		−0.8		+0.2		−0.8	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Indi. Mag. 3.2				β Delphini. Mag. 3.7				υ Capricorni. Mag. 5.3				α Delphini. Mag. 3.9			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 20 31		° ′ −47 34		h m 20 33		° ′ +14 17		h m 20 35		° ′ −18 25		h m 20 35		° ′ +15 36	
	s		″		s		″		s		″		s		″	
Jan. 1.1	39.337		76.74		36.112		68.23		15.934		71.36		43.659		55.55	
11.1	39.376	39	74.94	180	36.131	19	66.55	168	15.973	39	71.26	10	43.675	16	53.82	173
21.0	39.468	92	73.00	194	36.185	54	64.84	171	16.048	75	71.08	18	43.725	50	52.05	177
31.0	39.612	144	70.96	204	36.274	89	63.17	167	16.157	109	70.78	30	43.810	85	50.32	173
Feb. 10.0	39.802	190	68.85	211	36.394	120	61.62	155	16.298	141	70.39	39	43.929	119	48.71	161
19.9	40.036	234	66.73	212	36.548	154	60.25	137	16.471	173	69.87	52	44.080	151	47.28	143
29.9	40.312	276	64.64	209	36.731	183	59.16	109	16.672	201	69.21	66	44.261	181	46.12	116
Mar. 10.9	40.625	313	62.59	205	36.944	213	58.38	78	16.899	227	68.41	80	44.472	211	45.28	84
20.9	40.972	347	60.63	196	37.183	239	57.98	40	17.152	253	67.46	95	44.709	237	44.82	46
30.8	41.346	374	58.79	184	37.444	261	57.96	2 —	17.427	275	66.38	108	44.971	262	44.77	5 —
Apr. 9.8	41.746	400	57.11	168	37.725	281	58.37	41	17.720	293	65.16	122	45.252	281	45.13	36
19.8	42.164	418	55.61	150	38.021	296	59.18	81	18.031	311	63.85	131	45.548	296	45.91	78
29.8	42.595	431	54.34	127	38.328	307	60.37	119	18.352	321	62.48	137	45.856	308	47.09	118
May 9.7	43.031	436	53.31	103	38.639	311	61.92	155	18.679	327	61.06	142	46.167	311	48.63	154
19.7	43.465	434	52.57	74	38.946	307	63.75	183	19.005	326	59.66	140	46.478	311	50.47	184
29.7	43.887	422	52.11	46	39.245	299	65.84	209	19.324	319	58.31	135	46.777	299	52.57	210
June 8.6	44.287	400	51.96	15 —	39.528	283	68.09	225	19.628	304	57.04	127	47.061	284	54.86	229
18.6	44.658	371	52.13	17	39.786	258	70.47	238	19.911	283	55.91	113	47.321	260	57.28	242
28.6	44.988	330	52.59	46	40.016	230	72.91	244	20.164	253	54.91	100	47.552	231	59.76	248
July 8.6	45.270	282	53.35	76	40.209	193	75.33	242	20.383	219	54.08	83	47.747	195	62.24	248
18.5	45.497	227	54.37	102	40.362	153	77.69	236	20.561	178	53.46	62	47.901	154	64.67	243
28.5	45.664	167	55.61	124	40.472	110	79.94	225	20.695	134	53.02	44	48.012	111	66.98	231
Aug. 7.5	45.767	103	57.01	140	40.537	65	82.02	208	20.782	87	52.77	25	48.078	66	69.14	216
17.5	45.803	36 —	58.53	152	40.557	20 —	83.92	190	20.821	39 —	52.70	7 —	48.099	21 —	71.11	197
27.4	45.777	26	60.11	158	40.533	24	85.58	166	20.814	7	52.78	8	48.076	23	72.84	173
Sept. 6.4	45.689	88	61.65	154	40.469	64	87.01	143	20.764	50	53.00	22	48.012	64	74.35	151
16.4	45.548	141	63.12	147	40.370	99	88.16	115	20.675	89	53.32	32	47.914	98	75.56	121
26.3	45.362	186	64.42	130	40.243	127	89.04	88	20.555	120	53.69	37	47.786	128	76.51	95
Oct. 6.3	45.144	218	65.49	107	40.096	147	89.63	59	20.413	142	54.10	41	47.638	148	77.15	64
16.3	44.906	238	66.29	80	39.935	161	89.94	31	20.257	156	54.51	41	47.476	162	77.49	34
26.3	44.660	246	66.78	49	39.771	164	89.96	2 —	20.097	160	54.90	39	47.311	165	77.55	6 —
Nov. 5.2	44.419	241	66.92	14 —	39.612	159	89.68	28	19.942	155	55.25	35	47.150	161	77.30	25
15.2	44.199	220	66.71	21	39.465	147	89.13	55	19.801	141	55.54	29	47.001	149	76.76	54
25.2	44.008	191	66.15	56	39.339	126	88.30	83	19.684	117	55.77	23	46.871	130	75.92	84
Dec. 5.2	43.858	150	65.26	89	39.237	102	87.22	108	19.593	91	55.92	15	46.768	103	74.83	109
15.1	43.755	103	64.07	119	39.166	71	85.93	129	19.536	57	56.02	10	46.693	75	73.50	133
25.1	43.703	52 —	62.61	146	39.127	39	84.44	149	19.513	23 —	56.04	2 —	46.650	43	71.98	152
35.1	43.705	2	60.92	169	39.122	5	82.81	163	19.526	13	55.99	5	46.642	8	70.30	168
Mean Place	39.731		67.61		36.640		68.02		16.187		66.01		44.201		55.00	
Sec δ, Tan δ	1.483		−1.095		1.032		+0.255		1.054		−0.333		1.039		+0.280	
$D_\psi\,\alpha$, $D_\omega\,\alpha$	+0.08		+0.04		+0.06		−0.01		+0.07		+0.01		+0.06		−0.01	
$D_\psi\,\delta$, $D_\omega\,\delta$	+0.2		−0.8		+0.2		−0.8		+0.2		−0.8		+0.3		−0.8	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	**β Pavonis.** Mag. 3.6				**α Cygni.** (*Deneb.*) Mag. 1.3				**δ Delphini.** Mag. 4.5				**ψ Capricorni.** Mag. 4.3			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	20 37		−66 30		20 38		+44 58		20 39		+14 46		20 41		−25 34	
	s		″		s		″		s		″		s		″	
Jan. 1.1	23.28	2 —	33.31	272	32.736	49 —	52.20	270	31.727	13	21.37	167	7.271	34	30.45	52
11.1	23.26	8	30.59	289	32.687	1	49.50	287	31.740	47	19.70	171	7.305	72	29.93	64
21.0	23.34	18	27.70	299	32.688	51	46.63	292	31.787	82	17.99	167	7.377	108	29.29	75
31.0	23.52	26	24.71	302	32.739	103	43.71	286	31.869	115	16.32	157	7.485	142	28.54	85
Feb. 10.0	23.78	35	21.69	296	32.842	152	40.85	267	31.984	147	14.75	138	7.627	175	27.69	96
19.9	24.13	41	18.73	286	32.994	200	38.18	239	32.131	178	13.37	111	7.802	205	26.73	107
29.9	24.54	48	15.87	270	33.194	246	35.79	198	32.309	208	12.26	80	8.007	233	25.66	118
Mar. 10.9	25.02	54	13.17	247	33.440	284	33.81	151	32.517	234	11.46	44	8.240	260	24.48	126
20.9	25.56	58	10.70	221	33.724	320	32.30	96	32.751	258	11.02	4 —	8.500	284	23.22	133
30.8	26.14	63	8.49	192	34.044	349	31.34	40 —	33.009	278	10.98	38	8.784	305	21.89	139
Apr. 9.8	26.77	66	6.57	157	34.393	367	30.94	20	33.287	295	11.36	78	9.089	321	20.50	143
19.8	27.43	68	5.00	119	34.760	379	31.14	79	33.582	306	12.14	117	9.410	334	19.07	142
29.8	28.11	68	3.81	80	35.139	381	31.93	134	33.888	311	13.31	153	9.744	341	17.65	138
May 9.7	28.79	68	3.01	38 —	35.520	373	33.27	186	34.199	309	14.84	182	10.085	341	16.27	130
19.7	29.47	66	2.63	4	35.893	357	35.13	231	34.508	300	16.66	208	10.426	335	14.97	119
29.7	30.13	62	2.67	47	36.250	331	37.44	269	34.808	285	18.74	226	10.761	320	13.78	104
June 8.6	30.75	57	3.14	84	36.581	296	40.13	301	35.093	262	21.00	239	11.081	299	12.74	87
18.6	31.32	51	3.98	125	36.877	254	43.14	322	35.355	234	23.39	245	11.380	270	11.87	66
28.6	31.83	43	5.23	159	37.131	205	46.36	337	35.589	198	25.84	245	11.650	234	11.21	47
July 8.6	32.26	34	6.82	188	37.336	153	49.73	343	35.787	159	28.29	239	11.884	192	10.74	23
18.5	32.60	23	8.70	210	37.489	96	53.16	341	35.946	117	30.68	229	12.076	146	10.51	4 —
28.5	32.83	14	10.80	226	37.585	39 —	56.57	332	36.063	69	32.97	211	12.222	98	10.47	17
Aug. 7.5	32.97	4 —	13.06	233	37.624	18	59.89	317	36.132	25 —	35.08	194	12.320	47 —	10.64	33
17.5	33.01	7	15.39	234	37.606	73	63.06	293	36.157	19	37.02	171	12.367	2	10.97	48
27.4	32.94	18	17.73	223	37.533	124	65.99	265	36.138	59	38.73	147	12.365	48	11.45	58
Sept. 6.4	32.76	27	19.96	203	37.409	167	68.64	232	36.079	94	40.20	119	12.317	89	12.03	64
16.4	32.49	33	21.99	176	37.242	205	70.96	194	35.985	124	41.39	93	12.228	123	12.67	66
26.3	32.16	40	23.75	140	37.037	232	72.90	152	35.861	145	42.32	63	12.105	148	13.33	64
Oct. 6.3	31.76	44	25.15	98	36.805	251	74.42	107	35.716	159	42.95	34	11.957	164	13.97	58
16.3	31.32	46	26.13	50 —	36.554	261	75.49	58	35.557	164	43.29	5 —	11.793	169	14.55	48
26.3	30.86	46	26.63	1	36.293	258	76.07	9 —	35.393	159	43.34	25	11.624	164	15.03	37
Nov. 5.2	30.40	43	26.62	52	36.035	248	76.16	42	35.234	148	43.09	52	11.460	152	15.40	22
15.2	29.97	39	26.10	102	35.787	228	75.74	92	35.086	130	42.57	80	11.308	128	15.62	9 —
25.2	29.58	33	25.08	148	35.559	200	74.82	140	34.956	104	41.77	106	11.180	101	15.71	5
Dec. 5.2	29.25	25	23.60	191	35.359	165	73.42	185	34.852	76	40.71	128	11.079	66	15.66	20
15.1	29.00	16	21.69	229	35.194	125	71.57	224	34.776	45	39.43	147	11.013	31 —	15.46	34
25.1	28.84	7	19.40	258	35.069	80	69.33	255	34.731	10	37.96	163	10.982	6	15.12	44
35.1	28.77		16.82		34.989		66.78		34.721		36.33		10.988		14.68	
Mean Place	24.239		22.61		34.074		46.61		32.244		20.78		7.495		24.00	
Sec δ, Tan δ	2.509		−2.301		1.414		+0.999		1.034		+0.264		1.108		−0.479	
$D_\psi \alpha$, $D_\omega \alpha$	+0.11		+0.10		+0.04		−0.04		+0.06		−0.01		+0.07		+0.02	
$D_\psi \delta$, $D_\omega \delta$	+0.3		−0.8		+0.3		−0.8		+0.3		−0.8		+0.3		−0.8	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	*γ* **Delphini** *seq.* Mag. 4.5				*ε* **Cygni.** Mag. 2.6				*ε* **Aquarii.** Mag. 3.8				*η* **Cephei.** Mag. 3.6			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	20 42		+15 49		20 42		+33 39		20 43		− 9 47		20 43		+61 30	
	s		″		s		″		s		″		s		″	
Jan. 1.1	45.139		16.29		47.836		22.24		7.542		78.01		32.47		52.28	
		10		171		20		237		29		39		15		285
11.1	45.149		14.58		47.816	—	19.87		7.571		78.40		32.32		49.43	
		42		176		20		250		63		33		8		310
21.0	45.191		12.82		47.836		17.37		7.634		78.73		32.24		46.33	
		79		173		62		253		94		23		0		320
31.0	45.270		11.09		47.898		14.84		7.728		78.96		32.24		43.13	
		111		162		104		245		127		12		9		319
Feb. 10.0	45.381		9.47		48.002		12.39		7.855		79.08	—	32.33		39.94	
		143		144		142		226		156		3		16		304
19.9	45.524		8.03		48.144		10.13		8.011		79.05		32.49		36.90	
		175		118		183		197		184		21		26		279
29.9	45.699		6.85		48.327		8.16		8.195		78.84		32.75		34.11	
		206		86		220		161		212		40		31		240
Mar. 10.9	45.905		5.99		48.547		6.55		8.407		78.44		33.06		31.71	
		232		49		253		116		237		62		38		192
20.9	46.137		5.50		48.800		5.39		8.644		77.82		33.44		29.79	
		256		9		282		66		261		83		43		136
30.8	46.393		5.41	—	49.082		4.73		8.905		76.99		33.87		28.43	
		279		34		307		14		279		103		47		78
Apr. 9.8	46.672		5.75		49.389		4.59	—	9.184		75.96		34.34		27.65	
		295		76		326		40		296		124		51		13
19.8	46.967		6.51		49.715		4.99		9.480		74.72		34.85		27.52	—
		308		114		337		92		309		138		51		50
29.8	47.275		7.65		50.052		5.91		9.789		73.34		35.36		28.02	
		312		151		342		143		315		150		52		111
May 9.7	47.587		9.16		50.394		7.34		10.104		71.84		35.88		29.13	
		311		182		339		187		316		158		50		167
19.7	47.898		10.98		50.733		9.21		10.420		70.26		36.38		30.80	
		302		209		326		227		309		160		48		223
29.7	48.200		13.07		51.059		11.48		10.729		68.66		36.86		33.03	
		288		229		306		259		297		160		44		266
June 8.6	48.488		15.36		51.365		14.07		11.026		67.06		37.30		35.69	
		265		241		280		284		276		154		38		305
18.6	48.753		17.77		51.645		16.91		11.302		65.52		37.68		38.74	
		236		248		244		301		249		143		32		333
28.6	48.989		20.25		51.889		19.92		11.551		64.09		38.00		42.07	
		201		250		203		312		215		131		24		356
July 8.6	49.190		22.75		52.092		23.04		11.766		62.78		38.24		45.63	
		161		243		158		313		177		113		17		368
18.5	49.351		25.18		52.250		26.17		11.943		61.65		38.41		49.31	
		118		234		110		308		134		97		10		372
28.5	49.469		27.52		52.360		29.25		12.077		60.68		38.51		53.03	
		72		217		59		298		89		76		1		368
Aug. 7.5	49.541		29.69		52.419		32.23		12.166		59.92		38.52	—	56.71	
		27		199		8		281		43		59		7		355
17.5	49.568	—	31.68		52.427	—	35.04		12.209		59.33		38.45		60.26	
		17		177		40		257		0		41		14		337
27.4	49.551		33.45		52.387		37.61		12.209		58.92		38.31		63.63	
		58		152		84		231		43		22		22		311
Sept. 6.4	49.493		34.97		52.303		39.92		12.166		58.70		38.09		66.74	
		93		126		125		198		81		8		28		279
16.4	49.400		36.23		52.178		41.90		12.085		58.62	—	37.81		69.53	
		123		97		157		163		111		5		33		240
26.3	49.277		37.20		52.021		43.53		11.974		58.67		37.48		71.93	
		145		68		181		126		132		16		37		196
Oct. 6.3	49.132		37.88		51.840		44.79		11.842		58.83		37.11		73.89	
		159		38		197		85		147		26		40		149
16.3	48.973		38.26		51.643		45.64		11.695		59.09		36.71		75.38	
		164		8		205		42		152		31		43		97
26.3	48.809		38.34	—	51.438		46.06		11.543		59.40		36.28		76.35	
		161		22		203		0		148		37		42		42
Nov. 5.2	48.648		38.12		51.235		46.06		11.395		59.77		35.86		76.77	—
		150		52		193		44		135		40		42		14
15.2	48.498		37.60		51.042		45.62		11.260		60.17		35.44		76.63	
		130		81		173		88		115		42		40		71
25.2	48.368		36.79		50.869		44.74		11.145		60.59		35.04		75.92	
		109		105		150		129		92		44		36		127
Dec. 5.2	48.259		35.74		50.719		43.45		11.053		61.03		34.68		74.65	
		78		131		119		167		60		45		32		179
15.1	48.181		34.43		50.600		41.78		10.993		61.48		34.36		72.86	
		48		150		84		200		28		44		25		226
25.1	48.133		32.93		50.516		39.78		10.965	—	61.92		34.11		70.60	
		14		166		48		225		4		42		20		265
35.1	48.119		31.27		50.468		37.53		10.969		62.34		33.91		67.95	
Mean Place	45.664		15.31		48.741		18.08		7.805		74.23		35.002		44.08	
Sec δ, Tan δ	1.039		+0.283		1.202		+0.666		1.015		−0.173		2.097		+1.843	
$D_\psi a$, $D_\omega a$	+0.06		−0.01		+0.05		−0.03		+0.06		+0.01		+0.02		−0.08	
$D_\omega \delta$	+0.3		−0.8		+0.3		−0.8		+0.3		−0.8		+0.3		−0.8	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	**μ Aquarii.** Mag. 4.8				**β Indi.** Mag. 3.7				**32 Vulpeculæ.** Mag. 5.2				**220 H^1 Draconis.** Mag. 5.6			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	20 48		− 9 17		20 48		−58 45		20 50		+27 44		20 51		+80 14	
	s		″		s		″		s		″		s		″	
Jan. 1.1	7.217	24	61.14	41	14.721	7	88.99	234	58.059	17	18.98	214	17.54	69	27.33	270
11.1	7.241	58	61.55	35	14.714	63	86.65	253	58.042	21	16.84	225	16.85	47	24.63	300
21.0	7.299	89	61.90	25	14.777	130	84.12	266	58.063	59	14.59	227	16.38	23	21.63	322
31.0	7.388	121	62.15	14	14.907	195	81.46	271	58.122	95	12.32	219	16.15	0	18.41	326
Feb. 10.0	7.509	151	62.29	1	15.102	256	78.75	274	58.217	134	10.13	201	16.15	27	15.15	320
20.0	7.660	180	62.28	20	15.358	312	76.01	268	58.351	170	8.12	175	16.42	49	11.95	299
29.9	7.840	207	62.08	40	15.670	363	73.33	257	58.521	205	6.37	140	16.91	72	8.96	268
Mar. 10.9	8.047	232	61.68	61	16.033	412	70.76	243	58.726	236	4.97	99	17.63	90	6.28	225
20.9	8.279	257	61.07	83	16.445	450	68.33	224	58.962	265	3.98	52	18.53	107	4.03	173
30.8	8.536	277	60.24	104	16.895	486	66.09	199	59.227	290	3.46	3	19.60	120	2.30	119
Apr. 9.8	8.813	294	59.20	123	17.381	513	64.10	173	59.517	309	3.43	47	20.80	126	1.11	55
19.8	9.107	308	57.97	139	17.894	533	62.37	142	59.826	323	3.90	96	22.06	130	0.56	9
29.8	9.415	314	56.58	152	18.427	543	60.95	106	60.149	328	4.86	141	23.36	129	0.65	68
May 9.7	9.729	315	55.06	160	18.970	540	59.89	70	60.477	328	6.27	183	24.65	125	1.33	129
19.7	10.044	311	53.46	164	19.510	529	59.19	32	60.805	318	8.10	218	25.90	114	2.62	185
29.7	10.355	297	51.82	163	20.039	507	58.87	7	61.123	302	10.28	248	27.04	104	4.47	235
June 8.7	10.652	279	50.19	157	20.546	471	58.94	44	61.425	278	12.76	269	28.08	89	6.82	276
18.6	10.931	251	48.62	148	21.017	422	59.38	83	61.703	246	15.45	284	28.97	70	9.58	311
28.6	11.182	218	47.14	135	21.439	365	60.21	117	61.949	208	18.29	292	29.67	52	12.69	338
July 8.6	11.400	181	45.79	118	21.804	298	61.38	147	62.157	167	21.21	293	30.19	31	16.07	358
18.5	11.581	138	44.61	101	22.102	221	62.85	173	62.324	121	24.14	287	30.50	11	19.65	369
28.5	11.719	95	43.60	82	22.323	141	64.58	192	62.445	72	27.01	276	30.61	11	23.34	371
Aug. 7.5	11.814	48	42.78	61	22.464	58	66.50	204	62.517	25	29.77	257	30.50	31	27.05	365
17.5	11.862	3	42.17	44	22.522	24	68.54	208	62.542	22	32.34	236	30.19	52	30.70	351
27.4	11.865	39	41.73	25	22.498	104	70.62	205	62.520	66	34.70	210	29.67	71	34.21	333
Sept. 6.4	11.826	76	41.48	11	22.394	174	72.67	192	62.454	104	36.80	181	28.96	86	37.54	304
16.4	11.750	106	41.37	4	22.220	238	74.59	170	62.350	136	38.61	147	28.10	102	40.58	271
26.4	11.644	130	41.41	15	21.982	284	76.29	142	62.214	161	40.08	112	27.08	116	43.29	231
Oct. 6.3	11.514	145	41.56	26	21.698	319	77.71	107	62.053	177	41.20	75	25.92	124	45.60	188
16.3	11.369	150	41.82	31	21.379	335	78.78	64	61.876	184	41.95	36	24.68	131	47.48	133
26.3	11.219	148	42.13	37	21.044	335	79.42	22	61.692	184	42.31	2	23.37	135	48.81	84
Nov. 5.2	11.071	136	42.50	41	20.709	316	79.64	23	61.508	174	42.29	42	22.02	135	49.65	25
15.2	10.935	117	42.91	44	20.393	286	79.41	70	61.334	157	41.87	80	20.67	132	49.90	33
25.2	10.818	93	43.35	46	20.107	241	78.71	113	61.177	136	41.07	118	19.35	124	49.57	93
Dec. 5.2	10.725	64	43.81	47	19.866	184	77.58	153	61.041	107	39.89	152	18.11	113	48.64	149
15.1	10.661	32	44.28	46	19.682	123	76.05	189	60.934	75	38.37	180	16.98	100	47.15	201
25.1	10.629	1	44.74	44	19.559	55	74.16	219	60.859	41	36.57	204	15.98	83	45.14	242
35.1	10.628		45.18		19.504		71.97		60.818		34.53		15.15		42.72	
Mean Place	7.468		57.56		15.267		78.40		58.781		15.30		26.354		16.73	
Sec δ, Tan δ	1.013		−0.164		1.928		−1.649		1.130		+0.526		5.899		+5.814	
$D_\psi \alpha$, $D_\omega \alpha$	+0.06		+0.01		+0.09		+0.07		+0.05		−0.02		−0.05		−0.26	
$D_\psi \delta$, $D_\omega \delta$	+0.3		−0.7		+0.3		−0.7		+0.3		−0.7		+0.3		−0.7	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ν Cygni. Mag. 4.0				α Octantis. Mag. 5.2				γ Microscopii. Mag. 4.7				θ Capricorni. Mag. 4.2			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	20 54		+40 50		20 54		−77 20		20 56		−32 34		21 1		−17 33	
	s		″		s		″		s		″		s		″	
Jan. 1.1	1.357	52	41.64	252	33.00	18	56.63	309	8.396	17	80.09	92	13.459	14	67.68	7
11.1	1.305	8	39.12	268	32.82	1	53.54	329	8.413	57	79.17	108	13.473	47	67.61	17
21.0	1.297	38	36.44	275	32.81	15	50.25	341	8.470	93	78.09	122	13.520	81	67.44	30
31.0	1.335	85	33.69	270	32.96	33	46.84	345	8.563	132	76.87	133	13.601	113	67.14	41
Feb. 10.0	1.420	131	30.99	255	33.29	48	43.39	340	8.695	168	75.54	143	13.714	144	66.73	55
20.0	1.551	176	28.44	229	33.77	62	39.99	328	8.863	201	74.11	152	13.858	175	66.18	71
29.9	1.727	219	26.15	192	34.39	76	36.71	308	9.064	232	72.59	160	14.033	204	65.47	87
Mar. 10.9	1.946	259	24.23	148	35.15	87	33.63	283	9.296	263	70.99	165	14.237	230	64.60	102
20.9	2.205	293	22.75	96	36.02	97	30.80	252	9.559	289	69.34	166	14.467	257	63.58	119
30.9	2.498	322	21.79	41	36.99	104	28.28	215	9.848	315	67.68	167	14.724	279	62.39	132
Apr. 9.8	2.820	346	21.38	15	38.03	112	26.13	176	10.163	334	66.01	162	15.003	299	61.07	142
19.8	3.166	359	21.53	71	39.15	114	24.37	133	10.497	351	64.39	156	15.302	314	59.65	151
29.8	3.525	366	22.24	125	40.29	116	23.04	86	10.848	359	62.83	145	15.616	324	58.14	156
May 9.7	3.891	363	23.49	176	41.45	116	22.18	39	11.207	363	61.38	131	15.940	327	56.58	156
19.7	4.254	350	25.25	220	42.61	113	21.79	9	11.570	358	60.07	113	16.267	324	55.02	152
29.7	4.604	331	27.45	258	43.74	107	21.88	57	11.928	345	58.94	92	16.591	314	53.50	143
June 8.7	4.935	300	30.03	287	44.81	99	22.45	103	12.273	326	58.02	67	16.905	295	52.07	132
18.6	5.235	264	32.90	312	45.80	88	23.48	145	12.599	296	57.35	43	17.200	270	50.75	115
28.6	5.499	220	36.02	325	46.68	74	24.93	184	12.895	260	56.92	17	17.470	239	49.60	98
July 8.6	5.719	172	39.27	332	47.42	61	26.77	217	13.155	217	56.75	7	17.709	200	48.62	77
18.5	5.891	119	42.59	332	48.03	43	28.94	243	13.372	168	56.82	33	17.909	157	47.85	56
28.5	6.010	66	45.91	324	48.46	25	31.37	262	13.540	118	57.15	54	18.066	112	47.29	36
Aug. 7.5	6.076	11	49.15	309	48.71	7	33.99	272	13.658	65	57.69	72	18.178	64	46.93	15
17.5	6.087	42	52.24	288	48.78	11	36.71	268	13.723	11	58.41	87	18.242	17	46.78	3
27.4	6.045	90	55.12	262	48.67	31	39.39	258	13.734	38	59.28	95	18.259	27	46.81	19
Sept. 6.4	5.955	134	57.74	232	48.36	47	41.97	238	13.696	83	60.23	99	18.232	67	47.00	30
16.4	5.821	171	60.06	194	47.89	61	44.35	207	13.613	122	61.22	98	18.165	100	47.30	40
26.4	5.650	199	62.00	156	47.28	74	46.42	168	13.491	151	62.20	91	18.065	128	47.70	46
Oct. 6.3	5.451	219	63.56	112	46.54	83	48.10	121	13.340	172	63.11	79	17.937	144	48.16	48
16.3	5.232	230	64.68	67	45.71	88	49.31	67	13.168	181	63.90	62	17.793	152	48.64	47
26.3	5.002	231	65.35	20	44.83	90	49.98	12	12.987	179	64.52	46	17.641	152	49.11	45
Nov. 5.2	4.771	224	65.55	28	43.93	87	50.10	50	12.808	168	64.98	23	17.489	143	49.56	40
15.2	4.547	207	65.27	77	43.06	82	49.60	106	12.640	149	65.21	1	17.346	125	49.96	33
25.2	4.340	184	64.50	122	42.24	71	48.54	162	12.491	120	65.22	22	17.221	102	50.29	24
Dec. 5.2	4.156	154	63.28	166	41.53	60	46.92	212	12.371	87	65.00	43	17.119	75	50.53	18
15.1	4.002	119	61.62	205	40.93	46	44.80	255	12.284	51	64.57	64	17.044	43	50.71	8
25.1	3.883	79	59.57	235	40.47	29	42.25	290	12.233	12	63.93	81	17.001	10	50.79	0
35.1	3.804		57.22		40.18		39.35		12.221		63.12		16.991		50.79	
Mean Place	2.454		35.39		35.039		44.90		8.573		72.49		13.626		62.73	
Sec δ, Tan δ	1.322		+0.865		4.564		−4.453		1.187		−0.639		1.049		−0.317	
$D_\psi \alpha$, $D_\omega \alpha$	+0.04		−0.04		+0.15		+0.20		+0.07		+0.03		+0.07		+0.02	
$D_\psi \delta$, $D_\omega \delta$	+0.3		−0.7		+0.3		−0.7		+0.3		−0.7		+0.3		−0.7	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ξ Cygni. Mag. 3.9				61 Cygni *Pr.* Mag. 5.6				ν Aquarii. Mag. 4.5				Bradley 2777. Mag. 5.9			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	21 1		+43 35		21 3		+38 19		21 5		−11 42		21 7		+77 46	
	s		″		s		″		s		″		s		″	
Jan. 1.1	51.323		39.71		6.798		74.81		0.998		48.23		5.73		81.57	
11.1	51.253	70	37.19	252	6.759	39 —	72.50	231	1.007	9	48.48	25	5.15	58	78.98	259
21.0	51.230	23 —	34.49	270	6.760	1	70.03	247	1.050	43	48.65	17	4.73	42	76.05	293
31.0	51.254	24	31.69	280	6.805	45	67.48	255	1.124	74	48.72	7 —	4.50	23	72.89	316
Feb. 10.0	51.326	72	28.91	278	6.894	89	64.98	250	1.229	105	48.67	5	4.46	4 —	69.63	326
20.0	51.448	122	26.28	263	7.028	134	62.62	236	1.364	135	48.46	21	4.62	16	66.41	322
29.9	51.618	170	23.88	240	7.205	177	60.52	210	1.530	166	48.08	38	4.97	35	63.36	305
Mar. 10.9	51.834	216	21.84	204	7.423	218	58.78	174	1.723	193	47.51	57	5.49	52	60.58	278
20.9	52.093	259	20.23	161	7.680	257	57.47	131	1.945	222	46.73	78	6.19	70	58.20	238
30.9	52.389	296	19.13	110	7.972	292	56.65	82	2.192	247	45.76	97	7.01	82	56.33	187
Apr. 9.8	52.717	328	18.57	56 —	8.292	320	56.36	29 —	2.462	270	44.59	117	7.95	94	55.00	133
19.8	53.070	353	18.60	3	8.636	344	56.63	27	2.752	290	43.26	133	8.96	101	54.28	72
29.8	53.440	370	19.19	59	8.995	359	57.44	81	3.058	306	41.78	148	10.01	105	54.19	9 —
May 9.7	53.817	377	20.34	115	9.361	366	58.79	135	3.374	316	40.20	158	11.08	107	54.73	54
19.7	54.193	376	22.00	166	9.727	366	60.62	183	3.695	321	38.55	165	12.12	104	55.87	114
29.7	54.558	365	24.14	214	10.083	356	62.88	226	4.012	317	36.89	166	13.10	98	57.57	170
June 8.7	54.902	344	26.67	253	10.420	337	65.52	264	4.319	307	35.28	161	13.99	89	59.79	222
18.6	55.217	315	29.53	286	10.730	310	68.44	292	4.610	291	33.73	155	14.78	79	62.46	267
28.6	55.494	277	32.65	312	11.006	276	71.59	315	4.875	265	32.29	144	15.43	65	65.51	305
July 8.6	55.727	233	35.95	330	11.240	234	74.87	328	5.110	235	31.00	129	15.94	51	68.85	334
18.6	55.910	183	39.32	337	11.426	186	78.22	335	5.307	197	29.90	110	16.29	35	72.42	357
28.5	56.039	129	42.72	340	11.563	137	81.56	334	5.463	156	28.99	91	16.46	17	76.11	369
Aug. 7.5	56.113	74	46.06	334	11.648	85	84.82	326	5.574	111	28.28	71	16.48	2 —	79.86	375
17.5	56.131	18 —	49.27	321	11.680	32 —	87.93	311	5.639	65	27.77	51	16.31	17	83.59	373
27.4	56.093	38	52.27	300	11.660	20	90.84	291	5.658	19 —	27.46	31	15.99	32	87.21	362
Sept. 6.4	56.005	88	55.04	277	11.593	67	93.48	264	5.634	24	27.33	13 —	15.52	47	90.65	344
16.4	55.871	134	57.49	245	11.483	110	95.83	235	5.572	62	27.35	2	14.91	61	93.85	320
26.4	55.698	173	59.59	210	11.338	145	97.81	198	5.477	95	27.50	15	14.16	75	96.71	286
Oct. 6.3	55.493	205	61.29	170	11.163	175	99.42	161	5.355	122	27.76	26	13.31	85	99.20	249
16.3	55.267	226	62.56	127	10.969	194	100.61	119	5.218	137	28.10	34	12.37	94	101.25	205
26.3	55.027	240	63.38	82	10.764	205	101.36	75	5.071	147	28.48	38	11.37	100	102.82	157
Nov. 5.3	54.784	243	63.71	33 —	10.556	208	101.66	30 —	4.925	146	28.90	42	10.33	104	103.85	103
15.2	54.547	237	63.54	17	10.356	200	101.49	17	4.786	139	29.32	42	9.28	105	104.30	45 —
25.2	54.323	224	62.88	66	10.169	187	100.86	63	4.665	121	29.75	43	8.25	103	104.17	13
Dec. 5.2	54.123	200	61.73	115	10.006	163	99.79	107	4.564	101	30.16	41	7.26	99	103.44	73
15.1	53.952	171	60.13	160	9.869	137	98.29	150	4.491	73	30.54	38	6.35	91	102.13	131
25.1	53.814	138	58.13	200	9.766	103	96.44	185	4.446	45	30.89	35	5.54	81	100.28	185
35.1	53.717	97	55.79	234	9.701	65	94.27	217	4.433	13	31.19	30	4.87	67	97.94	234
Mean Place	52.493		32.37		7.780		68.51		1.177		44.50		12.344		69.47	
Sec δ, Tan δ	1.381		+0.952		1.275		+0.791		1.021		−0.207		4.728		+4.621	
$D_\psi\,a$, $D_\omega\,a$	+0.04		−0.05		+0.05		−0.04		+0.06		+0.01		−0.02		−0.22	
$D_\psi\,\delta$, $D_\omega\,\delta$	+0.3		−0.7		+0.3		−0.7		+0.3		−0.7		+0.3		−0.7	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	3 Piscis Australis. Mag. 5.6				ζ Cygni. Mag. 3.4				τ Cygni. Mag. 3.8				α Equulei. Mag. 4.1			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	21 8		−27 57		21 9		+29 52		21 11		+37 40		21 11		+ 4 53	
	s		″		s		″		s		″		s		″	
Jan. 1.1	18.522		52.27		20.925		59.70		25.335		77.83		37.223		59.87	
11.1	18.528	6	51.63	64	20.887	38	57.59	211	25.276	59	75.54	229	37.218	5 —	58.78	109
21.1	18.570	42	50.82	81	20.886	1 —	55.34	225	25.257	19 —	73.07	247	37.244	26	57.67	111
31.0	18.647	77	49.88	94	20.922	36	53.04	230	25.281	24	70.50	257	37.302	58	56.62	105
Feb. 10.0	18.760	113	48.80	108	20.997	75	50.79	225	25.348	67	67.95	255	37.390	88	55.67	95
20.0	18.906	146	47.61	119	21.111	114	48.69	210	25.458	110	65.54	241	37.510	120	54.88	79
29.9	19.085	179	46.28	133	21.263	152	46.81	188	25.612	154	63.36	218	37.660	150	54.31	57
Mar. 10.9	19.296	211	44.85	143	21.451	188	45.28	153	25.808	196	61.50	186	37.839	179	54.00	31
20.9	19.536	240	43.33	152	21.675	224	44.14	114	26.042	234	60.07	143	38.047	208	53.98	2 —
30.9	19.805	269	41.74	159	21.932	257	43.45	69	26.313	271	59.10	97	38.282	235	54.29	31
Apr. 9.8	20.099	294	40.10	164	22.215	283	43.25	20 —	26.616	303	58.67	43 —	38.542	260	54.93	64
19.8	20.416	317	38.44	166	22.523	308	43.56	31	26.942	326	58.77	10	38.822	280	55.88	95
29.8	20.748	332	36.80	164	22.847	324	44.36	80	27.287	345	59.41	64	39.119	297	57.14	126
May 9.8	21.091	343	35.22	158	23.180	333	45.64	128	27.643	356	60.57	116	39.427	308	58.66	152
19.7	21.442	351	33.74	148	23.516	336	47.36	172	28.000	357	62.23	166	39.739	312	60.42	176
29.7	21.790	348	32.42	132	23.846	330	49.46	210	28.349	349	64.32	209	40.049	310	62.34	192
June 8.7	22.127	337	31.25	117	24.162	316	51.87	241	28.682	333	66.78	246	40.348	299	64.38	204
18.6	22.448	321	30.29	96	24.455	293	54.55	268	28.990	308	69.55	277	40.630	282	66.50	212
28.6	22.742	294	29.57	72	24.718	263	57.39	284	29.267	277	72.56	301	40.888	258	68.60	210
July 8.6	23.002	260	29.09	48	24.945	227	60.35	296	29.503	236	75.72	316	41.115	227	70.66	206
18.6	23.223	221	28.87	22 —	25.132	187	63.35	300	29.694	191	78.95	323	41.307	192	72.64	198
28.5	23.397	174	28.89	2	25.272	140	66.31	296	29.837	143	82.20	325	41.458	151	74.49	185
Aug. 7.5	23.524	127	29.13	24	25.363	91	69.19	288	29.927	90	85.38	318	41.566	108	76.16	167
17.5	23.599	75	29.58	45	25.406	43 —	71.92	273	29.965	38 —	88.42	304	41.629	63	77.64	148
27.4	23.625	26 —	30.19	61	25.402	4	74.43	251	29.953	12	91.28	286	41.647	18 —	78.91	127
Sept. 6.4	23.600	25	30.95	76	25.353	49	76.71	228	29.892	61	93.89	261	41.624	23	79.96	105
16.4	23.533	67	31.78	83	25.263	90	78.69	198	29.787	105	96.22	233	41.564	60	80.78	82
26.4	23.428	105	32.63	85	25.139	124	80.35	166	29.647	140	98.20	198	41.473	91	81.37	59
Oct. 6.3	23.293	135	33.46	83	24.988	151	81.67	132	29.475	172	99.81	161	41.355	118	81.75	38
16.3	23.137	156	34.22	76	24.816	172	82.62	95	29.282	193	101.02	121	41.221	134	81.91	16 —
26.3	22.971	166	34.89	67	24.634	182	83.18	56	29.076	206	101.79	77	41.078	143	81.87	4
Nov. 5.3	22.803	168	35.41	52	24.450	184	83.33	15 —	28.865	211	102.12	33 —	40.933	145	81.62	25
15.2	22.645	158	35.76	35	24.271	179	83.08	25	28.659	206	102.00	12	40.795	138	81.20	42
25.2	22.503	142	35.93	17 —	24.106	165	82.42	66	28.465	194	101.41	59	40.672	123	80.60	60
Dec. 5.2	22.385	118	35.92	1	23.959	147	81.37	105	28.291	174	100.37	104	40.566	106	79.85	75
15.1	22.298	87	35.71	21	23.837	122	79.98	139	28.141	150	98.93	144	40.485	81	78.96	89
25.1	22.242	56	35.34	37	23.743	94	78.25	173	28.024	117	97.10	183	40.430	55	77.96	100
35.1	22.223	19	34.80	54	23.683	60	76.26	199	27.939	85	94.94	216	40.404	26	76.89	107
Mean Place	18.644		45.42		21.624		54.35		26.242		70.81		37.506		59.81	
Sec δ, Tan δ	1.132		−0.531		1.153		+0.575		1.263		+0.773		1.004		+0.086	
$D_\psi \alpha$, $D_\omega \alpha$	+0.07		+0.03		+0.05		−0.03		+0.05		−0.04		+0.06		0.00	
$D_\psi \delta$, $D_\omega \delta$	+0.3		−0.7		+0.3		−0.7		+0.3		−0.7		+0.3		−0.7	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	σ Cygni. Mag. 4.3				θ^1 Microscopii. Mag. 4.9				α Cephei. Mag. 2.6				ι Capricorni. Mag. 4.3			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	21 14		+39 2		21 15		−41 9		21 16		+62 13		21 17		−17 11	
	s		″		s		″		s		″		s		″	
Jan. 1.1	6.005	65	39.62	234	23.321	14	64.25	136	32.22	21	57.19	259	34.201	2	39.21	5
11.1	5.940	25	37.28	251	23.307	30	62.89	157	32.01	14	54.60	290	34.199	32	39.16	16
21.1	5.915	17	34.77	261	23.337	74	61.32	173	31.87	6	51.70	310	34.231	63	39.00	30
31.0	5.932	62	32.16	262	23.411	114	59.59	188	31.81	2	48.60	317	34.294	94	38.70	43
Feb. 10.0	5.994	106	29.54	249	23.525	155	57.71	199	31.83	10	45.43	311	34.388	127	38.27	57
20.0	6.100	151	27.05	224	23.680	195	55.72	207	31.93	19	42.32	293	34.515	158	37.70	75
29.9	6.251	194	24.81	194	23.875	232	53.65	210	32.12	26	39.39	263	34.673	186	36.95	91
Mar. 10.9	6.445	235	22.87	152	24.107	267	51.55	211	32.38	33	36.76	221	34.859	216	36.04	107
20.9	6.680	273	21.35	103	24.374	301	49.44	209	32.71	41	34.55	172	35.075	243	34.97	125
30.9	6.953	304	20.32	52	24.675	329	47.35	201	33.12	46	32.83	115	35.318	269	33.72	138
Apr. 9.8	7.257	330	19.80	3	25.004	355	45.34	191	33.58	49	31.68	55	35.587	290	32.34	150
19.8	7.587	350	19.83	59	25.359	375	43.43	176	34.07	52	31.13	8	35.877	309	30.84	159
29.8	7.937	360	20.42	111	25.734	390	41.67	158	34.59	54	31.21	69	36.186	321	29.25	165
May 9.8	8.297	362	21.53	162	26.124	396	40.09	136	35.13	53	31.90	129	36.507	327	27.60	164
19.7	8.659	355	23.15	206	26.520	396	38.73	109	35.66	52	33.19	184	36.834	327	25.96	162
29.7	9.014	339	25.21	244	26.916	385	37.64	80	36.18	48	35.03	234	37.161	319	24.34	153
June 8.7	9.353	314	27.65	276	27.301	366	36.84	52	36.66	44	37.37	277	37.480	302	22.81	141
18.6	9.667	279	30.41	300	27.667	337	36.32	18	37.10	38	40.14	312	37.782	280	21.40	125
28.6	9.946	241	33.41	317	28.004	300	36.14	13	37.48	32	43.26	339	38.062	249	20.15	108
July 8.6	10.187	195	36.58	326	28.304	255	36.27	43	37.80	23	46.65	359	38.311	213	19.07	86
18.6	10.382	145	39.84	327	28.559	205	36.70	72	38.03	17	50.24	370	38.524	171	18.21	63
28.5	10.527	93	43.11	322	28.764	149	37.42	96	38.20	8	53.94	372	38.695	127	17.58	43
Aug. 7.5	10.620	40	46.33	309	28.913	89	38.38	118	38.28	0	57.66	367	38.822	80	17.15	20
17.5	10.660	12	49.42	291	29.002	32	39.56	132	38.28	7	61.33	354	38.902	33	16.95	0
27.5	10.648	60	52.33	266	29.034	25	40.88	141	38.21	16	64.87	334	38.935	12	16.95	17
Sept. 6.4	10.588	106	54.99	238	29.009	79	42.29	143	38.05	23	68.21	306	38.923	52	17.12	31
16.4	10.482	143	57.37	205	28.930	124	43.72	138	37.82	28	71.27	272	38.871	88	17.43	41
26.4	10.339	174	59.42	167	28.806	161	45.10	128	37.54	33	73.99	236	38.783	117	17.84	49
Oct. 6.3	10.165	197	61.09	126	28.645	186	46.38	109	37.21	37	76.35	190	38.666	136	18.33	52
16.3	9.968	211	62.35	83	28.459	202	47.47	87	36.84	41	78.25	139	38.530	147	18.85	52
26.3	9.757	215	63.18	37	28.257	207	48.34	59	36.43	41	79.64	88	38.383	149	19.37	50
Nov. 5.3	9.542	211	63.55	10	28.050	199	48.93	29	36.02	42	80.52	32	38.234	142	19.87	46
15.2	9.331	201	63.45	56	27.851	184	49.22	2	35.60	41	80.84	26	38.092	130	20.33	39
25.2	9.130	181	62.89	102	27.667	155	49.20	34	35.19	39	80.58	84	37.962	107	20.72	30
Dec. 5.2	8.949	156	61.87	145	27.512	122	48.86	66	34.80	35	79.74	139	37.855	83	21.02	20
15.2	8.793	125	60.42	185	27.390	85	48.20	94	34.45	31	78.35	191	37.772	55	21.22	13
25.1	8.668	91	58.57	216	27.305	44	47.26	121	34.14	25	76.44	235	37.717	24	21.35	3
35.1	8.577		56.41		27.261		46.05		33.89		74.09		37.693		21.38	
Mean Place	6.946		32.10		23.444		55.14		34.588		45.72		34.307		34.54	
Sec δ, Tan δ	1.288		+0.811		1.328		−0.874		2.147		+1.899		1.047		−0.309	
$D_\psi \alpha$, $D_\omega \alpha$	+0.05		−0.04		+0.08		+0.04		+0.03		−0.10		+0.07		+0.02	
$D_\psi \delta$, $D_\omega \delta$	+0.3		−0.7		+0.3		−0.7		+0.3		−0.7		+0.3		−0.7	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	**1 Pegasi.** Mag. 4.2				**γ Pavonis.** Mag. 4.3				**ζ Capricorni.** Mag. 3.9				***g* Cygni.** Mag. 5.3			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 21 18		° ′ +19 26		h m 21 19		° ′ −65 44		h m 21 21		° ′ −22 46		h m 21 26		° ′ +46 9	
	s		″		s		″		s		″		s		″	
Jan. 1.1	11.638	26	44.04	170	30.31	11	62.44	256	52.392	6	38.66	34	19.779	105	81.09	236
11.1	11.612	— 5	42.34	178	30.20	3	59.88	282	52.386	— 27	38.32	49	19.674	60	78.73	262
21.1	11.617	40	40.56	180	30.17	— 6	57.06	302	52.413	61	37.83	65	19.614	12	76.11	276
31.0	11.657	73	38.76	174	30.23	14	54.04	312	52.474	93	37.18	79	19.602	— 37	73.35	280
Feb. 10.0	11.730	108	37.02	158	30.37	24	50.92	318	52.567	126	36.39	93	19.639	90	70.55	272
20.0	11.838	140	35.44	136	30.61	30	47.74	316	52.693	158	35.46	108	19.729	142	67.83	251
29.9	11.978	175	34.08	106	30.91	36	44.58	307	52.851	187	34.38	123	19.871	192	65.32	222
Mar. 10.9	12.153	207	33.02	70	31.27	44	41.51	293	53.038	220	33.15	136	20.063	240	63.10	183
20.9	12.360	236	32.32	31	31.71	50	38.58	272	53.258	248	31.79	148	20.303	284	61.27	135
30.9	12.596	265	32.01	— 12	32.21	55	35.86	246	53.506	273	30.31	157	20.587	323	59.92	82
Apr. 9.8	12.861	286	32.13	55	32.76	59	33.40	216	53.779	298	28.74	166	20.910	354	59.10	26
19.8	13.147	306	32.68	97	33.35	62	31.24	181	54.077	315	27.08	169	21.264	377	58.84	— 31
29.8	13.453	316	33.65	137	33.97	65	29.43	143	54.392	330	25.39	168	21.641	391	59.15	88
May 9.8	13.769	320	35.02	173	34.62	66	28.00	101	54.722	337	23.71	162	22.032	395	60.03	143
19.7	14.089	318	36.75	204	35.28	65	26.99	58	55.059	337	22.09	154	22.427	388	61.46	192
29.7	14.407	307	38.79	227	35.93	63	26.41	12	55.396	331	20.55	141	22.815	372	63.38	235
June 8.7	14.714	290	41.06	246	36.56	59	26.29	— 32	55.727	314	19.14	123	23.187	345	65.73	273
18.6	15.004	263	43.52	259	37.15	55	26.61	77	56.041	292	17.91	105	23.532	310	68.46	303
28.6	15.267	232	46.11	263	37.70	49	27.38	116	56.333	260	16.86	81	23.842	267	71.49	324
July 8.6	15.499	193	48.74	262	38.19	41	28.54	153	56.593	224	16.05	58	24.109	218	74.73	338
18.6	15.692	152	51.36	255	38.60	32	30.07	185	56.817	181	15.47	33	24.327	164	78.11	344
28.5	15.844	107	53.91	243	38.92	22	31.92	211	56.998	135	15.14	10	24.491	107	81.55	344
Aug. 7.5	15.951	61	56.34	227	39.14	12	34.03	228	57.133	86	15.04	— 12	24.598	49	84.99	335
17.5	16.012	15	58.61	206	39.26	2	36.31	237	57.219	38	15.16	32	24.647	— 8	88.34	320
27.5	16.027	— 27	60.67	183	39.28	— 8	38.68	237	57.257	— 9	15.48	48	24.639	61	91.54	298
Sept. 6.4	16.000	66	62.50	156	39.20	17	41.05	229	57.248	50	15.96	59	24.578	112	94.52	270
16.4	15.934	98	64.06	127	39.03	27	43.34	207	57.198	90	16.55	68	24.466	155	97.22	239
26.4	15.836	126	65.33	98	38.76	33	45.41	181	57.108	119	17.23	71	24.311	190	99.61	200
Oct. 6.3	15.710	144	66.31	68	38.43	39	47.22	144	56.989	140	17.94	69	24.121	219	101.61	159
16.3	15.566	155	66.99	33	38.04	43	48.66	100	56.849	152	18.63	65	23.902	237	103.20	113
26.3	15.411	158	67.32	3	37.61	44	49.66	52	56.697	155	19.28	57	23.665	246	104.33	65
Nov. 5.3	15.253	154	67.35	— 29	37.17	43	50.18	0	56.542	150	19.85	45	23.419	246	104.98	16
15.2	15.099	142	67.06	61	36.74	41	50.18	52	56.392	136	20.30	33	23.173	239	105.14	— 36
25.2	14.957	124	66.45	90	36.33	37	49.66	103	56.256	115	20.63	18	22.934	222	104.78	86
Dec. 5.2	14.833	102	65.55	119	35.96	31	48.63	153	56.141	91	20.81	4	22.712	197	103.92	134
15.2	14.731	76	64.36	141	35.65	23	47.10	196	56.050	61	20.85	— 10	22.515	167	102.58	179
25.1	14.655	47	62.95	162	35.42	17	45.14	234	55.989	29	20.75	27	22.348	131	100.79	217
35.1	14.608		61.33		35.25		42.80		55.960		20.48		22.217		98.62	
Mean Place	12.090		40.38		30.871		50.38		52.463		32.88		20.928		71.31	
Sec δ, Tan δ	1.061		+0.353		2.435		−2.220		1.085		−0.420		1.444		+1.042	
$D_\psi \alpha$, $D_\omega \alpha$	+0.05		−0.02		+0.10		+0.11		+0.07		+0.02		+0.04		−0.05	
$D_\psi \delta$, $D_\omega \delta$	+0.3		−0.6		+0.3		−0.6		+0.3		−0.6		+0.3		−0.6	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Aquarii. Mag. 3.1				β Cephei. Mag. 3.3				ξ Aquarii. Mag. 4.8				74 Cygni. Mag. 5.1			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 21 27		° ′ – 5 56		h m 21 27		° ′ +70 11		h m 21 33		° ′ – 8 13		h m 21 33		° ′ +40 1	
	s		″		s		″		s		″		s		″	
Jan. 1.1	8.153		30.79		31.42		43.89		16.805		55.68		34.018		77.57	
11.1	8.141	12	31.32	53	31.06	36	41.42	247	16.789	16	56.10	42	33.931	87	75.36	221
21.1	8.160	19	31.80	48	30.81	25	38.60	282	16.804	15	56.43	33	33.882	49	72.93	243
31.0	8.208	48	32.18	38	30.65	16	35.51	309	16.847	43	56.66	23	33.875	7	70.36	257
Feb. 10.0	8.287	79	32.44	26	30.60	5	32.30	321	16.921	74	56.77	11	33.912	37	67.78	258
20.0	8.397	110	32.54	10	30.68	8	29.09	321	17.025	104	56.71	6	33.994	82	65.27	251
Mar. 1.0	8.535	138	32.45	9	30.88	20	26.03	306	17.160	135	56.46	25	34.123	129	62.94	233
10.9	8.705	170	32.14	31	31.18	30	23.21	282	17.325	165	56.01	45	34.297	174	60.92	202
20.9	8.904	199	31.60	54	31.59	41	20.77	244	17.519	194	55.33	68	34.514	217	59.28	164
30.9	9.130	226	30.80	80	32.10	51	18.79	198	17.743	224	54.43	90	34.773	259	58.09	119
Apr. 9.8	9.383	253	29.77	103	32.68	58	17.37	142	17.994	251	53.30	113	35.068	295	57.41	68
19.8	9.658	275	28.50	127	33.32	64	16.53	84	18.267	273	51.97	133	35.392	324	57.26	15
29.8	9.952	294	27.05	145	34.00	68	16.31	22	18.560	293	50.46	151	35.741	349	57.66	40
May 9.8	10.261	309	25.42	163	34.70	70	16.71	40	18.869	309	48.80	166	36.103	362	58.60	94
19.7	10.576	315	23.67	175	35.40	70	17.74	103	19.186	317	47.05	175	36.472	369	60.05	145
29.7	10.893	317	21.86	181	36.08	68	19.33	159	19.504	318	45.24	181	36.838	366	61.95	190
June 8.7	11.201	308	20.01	185	36.71	63	21.45	212	19.817	313	43.43	181	37.190	352	64.26	231
18.7	11.497	296	18.20	181	37.29	58	24.05	260	20.116	299	41.66	177	37.522	332	66.92	266
28.6	11.771	274	16.45	175	37.79	50	27.04	299	20.395	279	39.99	167	37.822	300	69.84	292
July 8.6	12.015	244	14.83	162	38.21	42	30.33	329	20.646	251	38.45	154	38.085	263	72.97	313
18.6	12.225	210	13.35	148	38.53	32	33.88	355	20.863	217	37.07	138	38.303	218	76.21	324
28.5	12.396	171	12.05	130	38.74	21	37.58	370	21.040	177	35.88	119	38.473	170	79.50	329
Aug. 7.5	12.524	128	10.96	109	38.85	11	41.35	377	21.176	136	34.89	99	38.591	118	82.76	326
17.5	12.607	83	10.07	89	38.85	0	45.12	377	21.266	90	34.14	75	38.656	65	85.93	317
27.5	12.645	38	9.40	67	38.74	11	48.80	368	21.312	46	33.59	55	38.668	12	88.93	300
Sept. 6.4	12.642	3	8.93	47	38.53	21	52.32	352	21.314	2	33.24	35	38.630	38	91.73	280
16.4	12.598	44	8.66	27	38.23	30	55.61	329	21.277	37	33.09	15	38.546	84	94.25	252
26.4	12.520	78	8.56	10	37.84	39	58.60	299	21.204	73	33.10	1	38.421	125	96.46	221
Oct. 6.4	12.415	105	8.61	5	37.38	46	61.22	262	21.104	100	33.26	16	38.262	159	98.32	186
16.3	12.290	125	8.80	19	36.86	52	63.41	219	20.982	122	33.54	28	38.079	183	99.78	146
26.3	12.154	136	9.10	30	36.30	56	65.12	171	20.848	134	33.90	36	37.877	202	100.81	103
Nov. 5.3	12.015	139	9.48	38	35.71	59	66.31	119	20.710	138	34.33	43	37.667	210	101.40	59
15.2	11.880	135	9.93	45	35.11	60	66.93	62	20.574	136	34.81	48	37.457	210	101.52	12
25.2	11.758	122	10.44	51	34.50	61	66.95	2	20.450	124	35.31	50	37.253	204	101.17	35
Dec. 5.2	11.651	107	10.99	55	33.92	58	66.39	56	20.342	108	35.83	52	37.064	189	100.35	82
15.2	11.566	85	11.57	58	33.38	54	65.25	114	20.254	88	36.34	51	36.896	168	99.08	127
25.1	11.507	59	12.15	58	32.90	48	63.54	171	20.192	62	36.82	48	36.753	143	97.41	167
35.1	11.476	31	12.71	56	32.49	41	61.34	220	20.157	35	37.28	46	36.644	109	95.38	203
Mean Place	8.282		28.85		34.947		30.44		16.894		53.34		34.888		68.40	
Sec δ, Tan δ	1.005		–0.104		2.951		+2.777		1.010		–0.145		1.306		+0.840	
Dψ α, Dω α	+0.06		+0.01		+0.02		–0.15		+0.06		+0.01		+0.05		–0.04	
Dψ δ, Dω δ	+0.3		–0.6		+0.3		–0.6		+0.3		–0.6		+0.3		–0.6	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Capricorni. Mag. 3.8				ε Pegasi. Mag. 2.5				11 Cephei. Mag. 4.8				δ Capricorni. Mag. 3.0			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	21 35		−17 2		21 40		+ 9 29		21 40		+70 55		21 42		−16 30	
	s		″		s		″		s		″		s		″	
Jan. 1.1	26.316	17	36.46	4	3.388	31	23.89	122	38.21	40	42.65	231	24.378	22	36.67	1
11.1	26.299	— 15	36.42	16	3.357	3	22.67	124	37.81	30	40.34	271	24.356	— 7	36.68	— 12
21.1	26.314	44	36.26	31	3.354	— 27	21.43	123	37.51	19	37.63	300	24.363	38	36.56	28
31.0	26.358	76	35.95	45	3.381	58	20.20	114	37.32	9	34.63	315	24.401	68	36.28	41
Feb. 10.0	26.434	108	35.50	60	3.439	88	19.06	101	37.23	— 4	31.48	319	24.469	99	35.87	58
20.0	26.542	137	34.90	78	3.527	121	18.05	80	37.27	16	28.29	309	24.568	130	35.29	77
Mar. 1.0	26.679	170	34.12	97	3.648	153	17.25	55	37.43	29	25.20	288	24.698	162	34.52	93
10.9	26.849	199	33.15	113	3.801	184	16.70	24	37.72	39	22.32	254	24.860	192	33.59	113
20.9	27.048	229	32.02	130	3.985	215	16.46	— 9	38.11	49	19.78	210	25.052	224	32.46	129
30.9	27.277	257	30.72	145	4.200	243	16.55	44	38.60	58	17.68	158	25.276	250	31.17	145
Apr. 9.9	27.534	280	29.27	158	4.443	270	16.99	79	39.18	65	16.10	101	25.526	276	29.72	160
19.8	27.814	302	27.69	168	4.713	289	17.78	114	39.83	71	15.09	38	25.802	299	28.12	169
29.8	28.116	317	26.01	172	5.002	306	18.92	144	40.54	72	14.71	— 22	26.101	314	26.43	175
May 9.8	28.433	326	24.29	174	5.308	313	20.36	172	41.26	72	14.93	84	26.415	325	24.68	177
19.7	28.759	329	22.55	171	5.621	316	22.08	195	41.98	70	15.77	143	26.740	330	22.91	174
29.7	29.088	323	20.84	163	5.937	309	24.03	212	42.68	68	17.20	197	27.070	324	21.17	166
June 8.7	29.411	310	19.21	150	6.246	297	26.15	222	43.36	62	19.17	245	27.394	314	19.51	155
18.7	29.721	291	17.71	135	6.543	276	28.37	228	43.98	54	21.62	287	27.708	294	17.96	140
28.6	30.012	262	16.36	114	6.819	246	30.65	227	44.52	46	24.49	321	28.002	266	16.56	119
July 8.6	30.274	227	15.22	94	7.065	213	32.92	223	44.98	37	27.70	348	28.268	233	15.37	99
18.6	30.501	188	14.28	71	7.278	175	35.15	210	45.35	25	31.18	366	28.501	193	14.38	74
28.6	30.689	144	13.57	47	7.453	132	37.25	198	45.60	15	34.84	377	28.694	149	13.64	52
Aug. 7.5	30.833	97	13.10	24	7.585	89	39.23	179	45.75	5	38.61	379	28.843	104	13.12	27
17.5	30.930	51	12.86	4	7.674	45	41.02	157	45.80	— 7	42.40	374	28.947	57	12.85	7
27.5	30.981	5	12.82	— 17	7.719	2	42.59	137	45.73	18	46.14	360	29.004	12	12.78	— 14
Sept. 6.4	30.986	— 37	12.99	32	7.721	— 38	43.96	111	45.55	28	49.74	340	29.016	— 31	12.92	31
16.4	30.949	73	13.31	44	7.683	71	45.07	88	45.27	36	53.14	312	28.985	67	13.23	44
26.4	30.876	104	13.75	53	7.612	99	45.95	62	44.91	45	56.26	277	28.918	97	13.67	52
Oct. 6.4	30.772	125	14.28	57	7.513	121	46.57	39	44.46	51	59.03	237	28.821	122	14.19	59
16.3	30.647	139	14.85	59	7.392	133	46.96	14	43.95	56	61.40	190	28.699	135	14.78	60
26.3	30.508	144	15.44	56	7.259	139	47.10	— 8	43.39	60	63.30	138	28.564	141	15.38	59
Nov. 5.3	30.364	141	16.00	52	7.120	137	47.02	32	42.79	62	64.68	82	28.423	140	15.97	55
15.3	30.223	131	16.52	45	6.983	130	46.70	52	42.17	62	65.50	24	28.283	130	16.52	48
25.2	30.092	114	16.97	36	6.853	115	46.18	73	41.55	60	65.74	— 35	28.153	114	17.00	40
Dec. 5.2	29.978	92	17.33	25	6.738	97	45.45	90	40.95	57	65.39	96	28.039	95	17.40	31
15.2	29.886	65	17.58	16	6.641	75	44.55	105	40.38	52	64.43	152	27.944	70	17.71	19
25.1	29.821	38	17.74	5	6.566	50	43.50	117	39.86	45	62.91	205	27.874	43	17.90	9
35.1	29.783		17.79		6.516		42.33		39.41		60.86		27.831		17.99	
Mean Place	26.349		32.07		3.607		21.56		41.728		27.95		24.384		32.51	
Sec δ, Tan δ	1.046		−0.306		1.014		+0.167		3.060		+2.892		1.043		−0.296	
$D_\psi a$, $D_\omega a$	*+0.07*		+0.02		+0.06		−0.01		+0.02		−0.16		+0.06		+0.02	
$D_\psi \delta$, $D_\omega \delta$	*+0.3*		−0.6		+0.3		−0.6		+0.3		−0.6		+0.3		−0.6	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	π^2 Cygni. Mag. 4.3				μ Capricorni. Mag. 5.2				γ Gruis. Mag. 3.2				16 Pegasi. Mag. 5.0			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	21 43		+48 55		21 48		−13 56		21 48		−37 45		21 49		+25 31	
	s		″		s		″		s		″		s		″	
Jan. 1.1	40.158		25.53		43.078		55.72		50.832		46.80		13.935		53.20	
11.1	40.023	135	23.27	226	43.050	28	55.83	11	50.785	47	45.73	107	13.874	61	51.47	173
21.1	39.932	91	20.71	256	43.051	1	55.84	1	50.776	9	44.42	131	13.844	30	49.59	188
31.0	39.889	43	17.97	274	43.082	31	55.72	12	50.805	29	42.89	153	13.845	1	47.63	196
Feb. 10.0	39.898	9	15.14	283	43.141	59	55.45	27	50.871	66	41.16	173	13.881	36	45.67	196
20.0	39.961	63	12.34	280	43.233	92	54.99	46	50.976	105	39.28	188	13.953	72	43.82	185
Mar. 1.0	40.080	119	9.70	264	43.354	121	54.37	62	51.118	142	37.26	202	14.062	109	42.15	167
10.9	40.254	174	7.31	239	43.509	155	53.55	82	51.299	181	35.13	213	14.207	145	40.74	141
20.9	40.484	230	5.30	201	43.693	184	52.53	102	51.517	218	32.95	218	14.390	183	39.68	106
30.9	40.762	278	3.74	156	43.909	216	51.31	122	51.770	253	30.74	221	14.609	219	39.01	67
Apr. 9.9	41.084	322	2.69	105	44.152	243	49.93	138	52.056	286	28.54	220	14.861	252	38.78	23
19.8	41.443	359	2.20	49	44.423	271	48.39	154	52.374	318	26.40	214	15.141	280	39.00	22
29.8	41.830	387	2.28	8	44.716	293	46.72	167	52.717	343	24.35	205	15.446	305	39.68	68
May 9.8	42.237	407	2.94	66	45.024	308	44.97	175	53.080	363	22.43	192	15.766	320	40.80	112
19.7	42.650	413	4.15	121	45.345	321	43.16	181	53.456	376	20.72	171	16.097	331	42.33	153
29.7	43.061	411	5.88	173	45.671	326	41.34	182	53.838	382	19.22	150	16.430	333	44.22	189
June 8.7	43.456	395	8.08	220	45.995	324	39.58	176	54.217	379	18.00	122	16.757	327	46.43	221
18.7	43.829	373	10.68	260	46.305	310	37.94	164	54.583	366	17.07	93	17.068	311	48.88	245
28.3	44.167	338	13.62	294	46.599	294	36.41	153	54.928	345	16.47	60	17.358	290	51.53	265
July 8.6	44.462	295	16.81	319	46.867	268	35.07	134	55.242	314	16.19	28	17.617	259	54.29	276
18.6	44.708	246	20.17	336	47.100	233	33.92	115	55.518	276	16.24	5	17.840	223	57.11	282
28.6	44.899	191	23.65	348	47.297	197	33.00	92	55.749	231	16.62	38	18.022	182	59.91	280
Aug. 7.5	45.032	133	27.15	350	47.450	153	32.32	68	55.929	180	17.29	67	18.160	138	62.65	274
17.5	45.106	74	30.60	345	47.561	111	31.85	47	56.055	126	18.21	92	18.251	91	65.25	260
27.5	45.120	14	33.93	333	47.620	59	31.65	20	56.125	70	19.36	115	18.296	45	67.68	243
Sept. 6.4	45.076	44	37.07	314	47.640	20	31.64	1	56.140	15	20.66	130	18.297	1	69.89	221
16.4	44.979	97	39.97	290	47.616	24	31.77	13	56.103	37	22.05	139	18.255	42	71.86	197
26.4	44.836	143	42.56	259	47.555	61	32.10	33	56.019	84	23.47	142	18.177	78	73.54	168
Oct. 6.4	44.653	183	44.80	224	47.465	90	32.52	42	55.896	123	24.84	137	18.068	109	74.92	138
16.3	44.437	216	46.63	183	47.349	116	33.02	50	55.742	154	26.11	127	17.936	132	75.96	104
26.3	44.198	239	48.02	139	47.220	129	33.57	55	55.567	175	27.20	109	17.788	148	76.66	70
Nov. 5.3	43.946	252	48.93	91	47.083	137	34.14	57	55.382	185	28.07	87	17.631	157	77.00	34
15.3	43.688	258	49.33	40	46.947	136	34.67	53	55.197	185	28.67	60	17.472	159	77.00	0
25.2	43.433	255	49.21	12	46.818	129	35.17	50	55.020	177	28.98	31	17.319	153	76.62	38
Dec. 5.2	43.191	242	48.57	64	46.704	114	35.65	48	54.862	158	28.99	1	17.177	142	75.89	73
15.2	42.969	222	47.43	114	46.609	95	36.02	37	54.727	135	28.69	30	17.052	125	74.83	106
25.1	42.774	195	45.81	162	46.537	72	36.31	29	54.622	105	28.08	61	16.947	105	73.48	135
35.1	42.615	159	43.76	205	46.492	45	36.51	20	54.550	72	27.19	89	16.868	79	71.86	162
Mean Place	41.324		13.83		43.068		52.27		50.774		38.01		14.353		46.33	
Sec δ, Tan δ	1.522		+1.147		1.031		−0.248		1.265		−0.774		1.108		+0.478	
$D_\psi \alpha$, $D_\omega \alpha$	+0.04		−0.06		+0.06		+0.01		+0.07		+0.04		+0.05		−0.03	
$D_\psi \delta$, $D_\omega \delta$	+0.3		−0.6		+0.3		−0.5		+0.3		−0.5		+0.3		−0.5	

APPARENT PLACES OF STARS, 1916.

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	**79 Draconis.** Mag. 6.6				**ε Indi.** Mag. 4.7				**20 Pegasi.** Mag. 5.7				**α Aquarii.** Mag. 3.2			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 21 51		° ′ +73 18		h m 21 56		° ′ −57 7		h m 21 56		° ′ +12 42		h m 22 1		° ′ − 0 43	
	s		″		s		″		s		″		s		″	
Jan. 1.1	44.58	50	32.96	218	56.473	109	66.27	186	59.612	46	65.26	126	28.190	38	41.66	72
11.1	44.08	39	30.78	261	56.364	52	64.41	220	59.566	19	64.00	134	28.152	13	42.38	69
21.1	43.69	27	28.17	293	56.312	— 6	62.21	246	59.547	— 8	62.66	134	28.139	— 14	43.07	62
31.1	43.42	14	25.24	313	56.318	64	59.75	268	59.555	39	61.32	128	28.153	41	43.69	52
Feb. 10.0	43.28	0	22.11	321	56.382	123	57.07	282	59.594	70	60.04	116	28.194	71	44.21	36
20.0	43.28	14	18.90	312	56.505	180	54.25	291	59.664	103	58.88	97	28.265	103	44.57	16
Mar. 1.0	43.42	27	15.78	295	56.685	236	51.34	294	59.767	136	57.91	72	28.368	133	44.73	— 5
10.9	43.69	41	12.83	266	56.921	291	48.40	290	59.903	171	57.19	43	28.501	166	44.68	32
20.9	44.10	53	10.17	223	57.212	342	45.50	281	60.074	203	56.76	8	28.667	198	44.36	59
30.9	44.63	63	7.94	174	57.554	392	42.69	264	60.277	233	56.68	— 28	28.865	227	43.77	87
Apr. 9.9	45.26	71	6.20	117	57.946	433	40.05	245	60.510	261	56.96	64	29.092	256	42.90	112
19.8	45.97	78	5.03	60	58.379	468	37.60	219	60.771	285	57.60	101	29.348	279	41.78	138
29.8	46.75	80	4.43	— 5	58.847	498	35.41	189	61.056	303	58.61	134	29.627	297	40.40	161
May 9.8	47.55	82	4.48	65	59.345	516	33.52	154	61.359	314	59.95	166	29.924	312	38.79	178
19.8	48.37	80	5.13	125	59.861	525	31.98	116	61.673	319	61.61	190	30.236	316	37.01	191
29.7	49.17	77	6.38	179	60.386	521	30.82	75	61.992	316	63.51	212	30.552	315	35.10	200
June 8.7	49.94	70	8.17	227	60.907	507	30.07	31	62.308	303	65.63	226	30.867	305	33.10	202
18.7	50.64	64	10.44	276	61.414	478	29.76	— 12	62.611	286	67.89	235	31.172	289	31.08	200
28.6	51.28	53	13.20	313	61.892	437	29.88	54	62.897	259	70.24	237	31.461	264	29.08	191
July 8.6	51.81	44	16.33	340	62.329	388	30.42	95	63.156	227	72.61	236	31.725	234	27.17	180
18.6	52.25	31	19.73	361	62.717	326	31.37	134	63.383	190	74.97	228	31.959	197	25.37	164
28.6	52.56	20	23.34	376	63.043	257	32.71	167	63.573	148	77.25	214	32.156	156	23.73	146
Aug. 7.5	52.76	7	27.10	380	63.300	181	34.38	193	63.721	104	79.39	199	32.312	113	22.27	124
17.5	52.83	— 5	30.90	379	63.481	103	36.31	214	63.825	60	81.38	179	32.425	69	21.03	104
27.5	52.78	17	34.69	367	63.584	25	38.45	226	63.885	17	83.17	156	32.494	27	19.99	80
Sept. 6.5	52.61	28	38.36	349	63.609	— 52	40.71	228	63.902	— 23	84.73	133	32.521	— 13	19.19	59
16.4	52.33	39	41.85	327	63.557	120	42.99	221	63.879	58	86.06	107	32.508	48	18.60	37
26.4	51.94	48	45.12	294	63.437	181	45.20	206	63.821	87	87.13	81	32.460	80	18.23	17
Oct. 6.4	51.46	56	48.06	255	63.256	232	47.26	182	63.734	111	87.94	56	32.380	102	18.06	1
16.3	50.90	63	50.61	207	63.024	268	49.08	148	63.623	126	88.50	29	32.278	119	18.05	— 16
26.3	50.27	67	52.68	158	62.756	289	50.56	110	63.497	135	88.79	5	32.159	127	18.21	30
Nov. 5.3	49.60	71	54.26	103	62.467	296	51.66	67	63.362	137	88.84	— 22	32.032	128	18.51	42
15.3	48.89	71	55.29	46	62.171	289	52.33	19	63.225	132	88.62	45	31.904	124	18.93	52
25.2	48.18	70	55.75	— 16	61.882	267	52.52	— 29	63.093	120	88.17	68	31.780	112	19.45	61
Dec. 5.2	47.48	68	55.59	76	61.615	236	52.23	76	62.973	105	87.49	89	31.668	98	20.06	67
15.2	46.80	62	54.83	136	61.379	194	51.47	121	62.868	87	86.60	106	31.570	78	20.73	73
25.2	46.18	54	53.47	189	61.185	145	50.26	162	62.781	63	85.54	121	31.492	57	21.46	73
35.1	45.64		51.58		61.040		48.64		62.718		84.33		31.435		22.19	
Mean Place	48.529		16.99		56.495		54.26		59.793		61.36		28.213		42.04	
Sec δ, Tan δ	3.482		+3.335		1.842		−1.548		1.025		+0.226		1.000		−0.013	
$D_\psi a$, $D_\omega a$	*+0.01*		*−0.19*		+0.08		+0.09		+0.06		−0.01		+0.06		0.00	
$D_\psi \delta$, $D_\omega \delta$	*+0.3*		*−0.5*		+0.3		−0.5		+0.3		−0.5		+0.3		−0.5	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ι Aquarii. Mag. 4.4				20 Cephei. Mag. 5.4				α Gruis. Mag. 2.2				ι Pegasi. Mag. 4.0			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 22 1		° ′ −14 16		h m 22 2		° ′ +62 22		h m 22 2		° ′ −47 21		h m 22 3		° ′ +24 55	
	s		″		s		″		s		″		s		″	
Jan. 1.1	54.191		43.05		25.36		47.18		56.788		77.39		5.652		71.17	
		38		12		27		214		85		145		68		164
11.1	54.153		43.17		25.09		45.04		56.703		75.94		5.584		69.53	
		11		0		21		253		43		177		41		178
21.1	54.142	—	43.17		24.88		42.51		56.660		74.17		5.543		67.75	
		18		15		15		282		1		204		10		187
31.1	54.160		43.02		24.73		39.69		56.659	—	72.13		5.533	—	65.88	
		46		32		6		301		46		225		23		188
Feb. 10.0	54.206		42.70		24.67	—	36.68		56.705		69.88		5.556		64.00	
		76		48		1		307		90		242		58		180
20.0	54.282		42.22		24.68		33.61		56.795		67.46		5.614		62.20	
		108		66		9		300		136		256		94		162
Mar. 1.0	54.390		41.56		24.77		30.61		56.931		64.90		5.708		60.58	
		139		87		18		282		181		263		133		139
10.9	54.529		40.69		24.95		27.79		57.112		62.27		5.841		59.19	
		172		106		26		249		226		266		170		105
20.9	54.701		39.63		25.21		25.30		57.338		59.61		6.011		58.14	
		204		126		33		209		267		264		207		69
30 9	54.905		38.37		25.54		23.21		57.605		56.97		6.218		57.45	
		232		143		40		160		303		255		240		26
Apr. 9.9	55.137		36.94		25.94		21.61		57.913		54.42		6.458		57.19	—
		262		161		46		105		344		245		272		17
19.8	55.399		35.33		26.40		20.56		58.257		51.97		6.730		57.36	
		286		172		51		45		377		227		298		62
29.8	55.685		33.61		26.91		20.11	—	58.634		49.70		7.028		57.98	
		306		182		53		14		402		205		317		105
May 9.8	55.991		31.79		27.44		20.25		59.036		47.65		7.345		59.03	
		319		186		54		75		419		177		329		145
19.8	56.310		29.93		27.98		21.00		59.455		45.88		7.674		60.48	
		326		185		54		132		429		148		333		183
29.7	56.636		28.08		28.52		22.32		59.884		44.40		8.007		62.31	
		325		181		53		186		428		112		331		214
June 8.7	56.961		26.27		29.05		24.18		60.312		43.28		8.338		64.45	
		316		171		50		234		417		75		319		239
18.7	57.277		24.56		29.55		26.52		60.729		42.53		8.657		66.84	
		299		156		45		277		395		37		297		259
28.6	57.576		23.00		30.00		29.29		61.124		42.16	—	8.954		69.43	
		276		138		40		311		364		2		272		271
July 8.6	57.852		21.62		30.40		32.40		61.488		42.18		9.226		72.14	
		243		116		34		338		323		42		236		278
18.6	58.095		20.46		30.74		35.78		61.811		42.60		9.462		74.92	
		207		95		26		357		272		79		196		277
28.6	58.302		19.51		31.00		39.35		62.083		43.39		9.658		77.69	
		165		70		18		369		217		112		153		271
Aug. 7.5	58.467		18.81		31.18		43.04		62.300		44.51		9.811		80.40	
		120		46		11		373		155		139		108		258
17.5	58.587		18.35		31.29		46.77		62.455		45.90		9.919		82.98	
		75		22		3		369		92		163		62		244
27.5	58.662		18.13		31.32	—	50.46		62.547		47.53		9.981		85.42	
		30		0		6		356		28		178		16		221
Sept. 6.5	58.692	—	18.13		31.26		54.02		62.575	—	49.31		9.997	—	87.63	
		12		18		13		337		33		186		25		198
16.4	58.680		18.31		31.13		57.39		62.542		51.17		9.972		89.61	
		49		35		19		312		89		186		63		171
26.4	58.631		18.66		30.94		60.51		62.453		53.03		9.909		91.32	
		82		47		25		280		139		178		93		141
Oct. 6.4	58.549		19.13		30.69		63.31		62.314		54.81		9.816		92.73	
		106		55		30		240		178		160		120		109
16.3	58.443		19.68		30.39		65.71		62.136		56.41		9.696		93.82	
		125		60		35		197		207		138		138		75
26.3	58.318		20.28		30.04		67.68		61.929		57.79		9.558		94.57	
		133		60		37		147		223		107		148		42
Nov. 5.3	58.185		20.88		29.67		69.15		61.706		58.86		9.410		94.99	
		134		59		39		92		229		71		152		6
15.3	58.051		21.47		29.28		70.07		61.477		59.57		9.258		95.05	—
		129		55		40		38		223		33		149		29
25.2	57.922		22.02		28.88		70.45	—	61.254		59.90	—	9.109		94.76	
		117		49		39		20		206		7		141		63
Dec. 5.2	57.805		22.51		28.49		70.25		61.048		59.83		8.968		94.13	
		101		40		37		79		183		46		127		95
15.2	57.704		22.91		28.12		69.46		60.865		59.37		8.841		93.18	
		79		31		35		134		151		87		108		126
25.2	57.625		23.22		27.77		68.12		60.714		58.50		8.733		91.92	
		57		19		30		185		114		124		86		150
35.1	57.568		23.41		27.47		66.27		60.600		57.26		8.647		90.42	
Mean Place	54.120		39.78		27.298		31.67		56.683		66.74		5.985		63.68	
Sec δ, Tan δ	1.032		−0.254		2.157		+1.911		1.477		−1.086		1.103		+0.465	
$D_\psi \alpha$, $D_\omega \alpha$	+0.06		+0.01		+0.04		−0.11		+0.08		+0.06		+0.05		−0.03	
$D_\psi \delta$, $D_\omega \delta$	+0.3		−0.5		+0.3		−0.5		+0.3		−0.5		+0.3		−0.5	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	θ Pegasi. Mag. 3.7				π Pegasi. Mag. 4.4				ζ Cephei. Mag. 3.6				24 Cephei. Mag. 5.0			
	Right Ascension.	Diff.	Declination.	Diff.	Right Ascension.	Diff.	Declination.	Diff.	Right Ascension.	Diff.	Declination.	Diff.	Right Ascension.	Diff.	Declination.	Diff.
	h m 22 5		° ′ + 5 47		h m 22 6		° ′ +32 45		h m 22 7		° ′ +57 47		h m 22 8		° ′ +71 55	
	s		″		s		″		s		″		s		″	
Jan. 1.1	57.719		5.56		14.857		65.96		54.797		28.14		8.42		55.15	
11.1	57.673	46	4.58	98	14.768	89	64.16	180	54.573	224	26.06	208	7.94	48	53.14	201
21.1	57.653	20	3.59	99	14.708	60	62.14	202	54.398	175	23.60	246	7.55	39	50.67	247
31.1	57.658	5	2.62	97	14.682	26	59.96	218	54.279	119	20.86	274	7.26	29	47.87	280
Feb. 10.0	57.693	35	1.74	88	14.692	10	57.75	221	54.225	54	17.94	292	7.10	16	44.82	305
20.0	57.758	65	1.00	74	14.739	47	55.60	215	54.237	12	14.96	298	7.06	4	41.66	316
Mar. 1.0	57.853	95	0.44	56	14.828	89	53.58	202	54.323	86	12.06	290	7.14	8	38.52	314
11.0	57.982	129	0.13	31	14.959	131	51.81	177	54.479	156	9.35	271	7.35	21	35.53	299
20.9	58.144	162	0.07	6	15.132	173	50.35	146	54.706	227	6.94	241	7.69	34	32.81	272
30.9	58.337	193	0.33	26	15.346	214	49.30	105	55.001	295	4.94	200	8.14	45	30.46	235
Apr. 9.9	58.563	226	0.91	58	15.597	251	48.69	61	55.353	352	3.41	153	8.70	56	28.59	187
19.8	58.817	254	1.79	88	15.881	284	48.55	14	55.757	404	2.44	97	9.35	65	27.25	134
29.8	59.095	278	3.00	121	16.194	313	48.91	36	56.202	445	2.04	40	10.05	70	26.50	75
May 9.8	59.392	297	4.47	147	16.527	333	49.75	84	56.674	472	2.23	19	10.80	75	26.36	14
19.8	59.703	311	6.19	172	16.874	347	51.06	131	57.161	487	3.01	78	11.56	76	26.83	47
29.7	60.021	318	8.10	191	17.224	350	52.79	173	57.651	490	4.35	134	12.32	76	27.90	107
June 8.7	60.337	316	10.16	206	17.571	347	54.90	211	58.128	477	6.22	187	13.06	74	29.53	163
18.7	60.643	306	12.31	215	17.904	333	57.32	242	58.581	453	8.55	233	13.76	70	31.68	215
28.7	60.933	290	14.49	218	18.215	311	60.01	269	58.997	416	11.30	275	14.39	63	34.28	260
July 8.6	61.198	265	16.65	216	18.497	282	62.87	286	59.366	369	14.38	308	14.94	55	37.28	300
18.6	61.433	235	18.73	208	18.742	245	65.85	298	59.680	314	17.71	333	15.40	46	40.59	331
28.6	61.631	198	20.69	196	18.945	203	68.87	302	59.932	252	21.24	353	15.74	34	44.14	355
Aug. 7.5	61.790	159	22.51	182	19.102	157	71.88	301	60.116	184	24.86	362	15.99	25	47.86	372
17.5	61.906	116	24.12	161	19.211	109	74.81	293	60.231	115	28.52	366	16.12	13	51.66	380
27.5	61.977	71	25.54	142	19.272	61	77.60	279	60.274	43	32.12	360	16.14	2	55.46	380
Sept. 6.5	62.007	30	26.73	119	19.285	13	80.19	259	60.250	24	35.60	348	16.05	9	59.19	373
16.4	61.996	11	27.69	96	19.254	31	82.56	237	60.161	89	38.89	329	15.83	22	62.76	357
26.4	61.951	45	28.42	73	19.183	71	84.64	208	60.011	150	41.92	303	15.53	30	66.12	336
Oct. 6.4	61.874	77	28.92	50	19.078	105	86.41	177	59.809	202	44.62	270	15.14	39	69.17	305
16.4	61.775	99	29.19	27	18.946	132	87.85	144	59.563	246	46.96	234	14.67	47	71.86	269
26.3	61.658	117	29.27	8	18.794	152	88.90	105	59.282	281	48.86	190	14.14	53	74.12	226
Nov. 5.3	61.532	126	29.15	12	18.628	166	89.57	67	58.974	308	50.26	140	13.55	59	75.89	177
15.3	61.403	129	28.84	31	18.458	170	89.83	26	58.651	323	51.16	90	12.93	62	77.13	124
25.2	61.280	123	28.36	48	18.288	170	89.68	15	58.323	328	51.51	35	12.29	64	77.79	66
Dec. 5.2	61.164	116	27.73	63	18.126	162	89.12	56	57.998	325	51.29	22	11.65	64	77.85	6
15.2	61.063	101	26.96	77	17.977	149	88.18	94	57.689	309	50.52	77	11.03	62	77.29	56
25.2	60.979	84	26.09	87	17.846	131	86.85	133	57.404	285	49.20	132	10.45	58	76.14	115
35.1	60.918	61	25.13	96	17.739	107	85.21	164	57.152	252	47.39	181	9.93	52	74.44	170
Mean Place	57.779		3.19		15.333		56.25		56.287		12.95		11.728		37.91	
Sec δ, Tan δ	1.005		+0.101		1.189		+0.644		1.876		+1.587		3.224		+3.065	
$D_\psi \alpha$, $D_\omega \alpha$	+0.06		−0.01		+0.05		−0.04		+0.04		−0.09		+0.02		−0.18	
$D_\psi \delta$, $D_\omega \delta$	+0.3		−0.5		+0.3		−0.5		+0.4		−0.5		+0.4		−0.5	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	θ Aquarii. Mag. 4.3				α Tucanæ. Mag. 2.9				γ Aquarii. Mag. 4.0				31 Pegasi. Mag. 4.9			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	22 12		− 8 11		22 12		−60 40		22 17		− 1 48		22 17		+11 46	
	s		″		s		″		s		″		s		″	
Jan. 1.1	24.213	45	68.39	40	45.40	17	55.60	197	19.148	49	38.75	65	22.939	59	57.96	116
11.1	24.168	20	68.79	30	45.23	11	53.63	234	19.099	26	39.40	62	22.880	35	56.80	122
21.1	24.148	— 6	69.09	18	45.12	5	51.29	265	19.073	1	40.02	54	22.845	9	55.58	123
31.1	24.154	34	69.27	6	45.07	— 1	48.64	289	19.072	— 27	40.56	42	22.836	— 20	54.35	117
Feb. 10.0	24.188	64	69.33	— 12	45.08	8	45.75	307	19.099	57	40.98	27	22.856	49	53.18	107
20.0	24.252	93	69.21	31	45.16	14	42.68	317	19.156	86	41.25	8	22.905	83	52.11	90
Mar. 1.0	24.345	127	68.90	52	45.30	21	39.51	321	19.242	119	41.33	— 14	22.988	117	51.21	66
11.0	24.472	158	68.38	75	45.51	26	36.30	317	19.361	151	41.19	39	23.105	151	50.55	38
20.9	24.630	190	67.63	97	45.77	33	33.13	308	19.512	184	40.80	66	23.256	184	50.17	7
30.9	24.820	222	66.66	121	46.10	40	30.05	294	19.696	216	40.14	91	23.440	218	50.10	— 28
Apr. 9.9	25.042	251	65.45	141	46.50	43	27.11	272	19.912	246	39.23	118	23.658	249	50.38	64
19.8	25.293	275	64.04	161	46.93	48	24.39	245	20.158	271	38.05	142	23.907	274	51.02	98
29.8	25.568	298	62.43	175	47.41	51	21.94	214	20.429	293	36.63	164	24.181	296	52.00	132
May 9.8	25.866	312	60.68	185	47.92	53	19.80	176	20.722	309	34.99	180	24.477	312	53.32	161
19.8	26.178	319	58.83	192	48.45	55	18.04	136	21.031	317	33.19	192	24.789	318	54.93	186
29.7	26.497	321	56.91	193	49.00	56	16.68	92	21.348	318	31.27	200	25.107	320	56.79	208
June 8.7	26.818	313	54.98	188	49.56	54	15.76	47	21.666	311	29.27	202	25.427	310	58.87	223
18.7	27.131	298	53.10	181	50.10	51	15.29	1	21.977	296	27.25	199	25.737	296	61.10	230
28.7	27.429	275	51.29	165	50.61	48	15.28	— 45	22.273	274	25.26	191	26.033	274	63.40	234
July 8.6	27.704	246	49.64	149	51.09	43	15.73	90	22.547	245	23.35	179	26.307	242	65.74	231
18.6	27.950	210	48.15	130	51.52	35	16.63	131	22.792	210	21.56	162	26.549	207	68.05	225
28.6	28.160	170	46.85	106	51.87	28	17.94	168	23.002	171	19.94	143	26.756	167	70.30	211
Aug. 7.5	28.330	128	45.79	84	52.15	21	19.62	196	23.173	129	18.51	121	26.923	124	72.41	196
17.5	28.458	83	44.95	60	52.36	12	21.58	220	23.302	86	17.30	99	27.047	82	74.37	177
27.5	28.541	39	44.35	37	52.48	4	23.78	234	23.388	43	16.31	75	27.129	38	76.14	154
Sept. 6.5	28.580	— 1	43.98	16	52.52	— 5	26.12	238	23.431	3	15.56	53	27.167	— 1	77.68	132
16.4	28.579	39	43.82	—	52.47	13	28.50	233	23.434	— 35	15.03	32	27.166	39	79.00	107
26.4	28.540	71	43.85	19	52.34	20	30.83	219	23.399	66	14.71	13	27.127	69	80.07	81
Oct. 6.4	28.469	95	44.04	33	52.14	26	33.02	194	23.333	91	14.58	— 4	27.058	94	80.88	57
16.4	28.374	115	44.37	42	51.88	31	34.96	161	23.242	108	14.62	21	26.964	114	81.45	31
26.3	28.259	124	44.79	50	51.57	33	36.57	122	23.134	121	14.83	32	26.850	125	81.76	8
Nov. 5.3	28.135	127	45.29	54	51.24	35	37.79	75	23.013	124	15.15	44	26.725	129	81.84	— 17
15.3	28.008	124	45.83	56	50.89	35	38.54	26	22.889	122	15.59	53	26.596	127	81.67	38
25.2	27.884	114	46.39	56	50.54	33	38.80	— 25	22.767	113	16.12	59	26.469	120	81.29	60
Dec. 5.2	27.770	101	46.95	54	50.21	30	38.55	76	22.654	101	16.71	65	26.349	110	80.69	81
15.2	27.669	84	47.49	51	49.91	26	37.79	126	22.553	86	17.36	68	26.239	93	79.88	96
25.2	27.585	61	48.00	45	49.65	22	36.53	170	22.467	64	18.04	67	26.146	74	78.92	110
35.1	27.524		48.45		49.43		34.83		22.403		18.71		26.072		77.82	
Mean Place	24.128		66.99		45.362		42.90		19.086		39.31		23.007		53.43	
Sec δ, Tan δ	1.010		−0.144		2.042		−1.781		1.000		−0.032		1.022		+0.209	
D$_\psi$ α, D$_\omega$ α	+0.06		+0.01		+0.08		+0.11		+0.06		0.00		+0.06		−0.01	
D$_\psi$ δ, D$_\omega$ δ	+0.4		−0.5		+0.4		−0.5		+0.4		−0.4		+0.4		−0.4	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Lacertæ. Mag. 4.6				π Aquarii. Mag. 4.6			
	Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 22 20		° ′ +51 48		h m 22 20		° ′ + 0 57	
	s		″		s		″	
Jan. 1.2	14.264		43.37		59.280		3.96	
11.1	14.078	186	41.44	193	59.228	52	3.20	76
21.1	13.932	146	39.14	230	59.200	28	2.47	73
31.1	13.831	101	36.55	259	59.195	5	1.78	69
Feb. 10.0	13.782	49	33.81	274	59.218	23	1.23	55
20.0	13.789	7	31.00	281	59.268	50	0.80	43
Mar. 1.0	13.855	66	28.26	274	59.351	83	0.54	26
11.0	13.982	127	25.69	257	59.464	113	0.53	1
20.9	14.171	189	23.42	227	59.611	147	0.76	23
30.9	14.418	247	21.52	190	59.792	181	1.28	52
Apr. 9.9	14.719	301	20.09	143	60.007	215	2.07	79
19.9	15.067	348	19.19	90	60.249	242	3.12	105
29.8	15.454	387	18.83	36	60.518	269	4.46	134
May 9.8	15.870	416	19.03	20	60.809	291	6.03	157
19.8	16.303	433	19.80	77	61.117	308	7.79	176
29.7	16.742	439	21.12	132	61.432	315	9.71	192
June 8.7	17.176	434	22.93	181	61.749	317	11.73	202
18.7	17.593	417	25.20	227	62.059	310	13.80	207
28.7	17.981	388	27.86	266	62.355	296	15.86	206
July 8.6	18.331	350	30.84	298	62.629	274	17.89	203
18.6	18.636	305	34.06	322	62.877	248	19.77	188
28.6	18.887	251	37.45	339	63.087	210	21.52	175
Aug. 7.6	19.081	194	40.95	350	63.260	173	23.09	157
17.5	19.213	132	44.45	350	63.391	131	24.48	139
27.5	19.285	72	47.93	348	63.480	89	25.63	115
Sept. 6.5	19.296	11	51.28	335	63.525	45	26.55	92
16.4	19.250	46	54.44	316	63.531	6	27.25	70
26.4	19.149	101	57.35	291	63.500	31	27.75	50
Oct. 6.4	19.003	146	59.95	260	63.437	63	28.00	25
16.4	18.818	185	62.19	224	63.349	88	28.08	8
26.3	18.600	218	64.01	182	63.242	107	27.99	9
Nov. 5.3	18.359	241	65.39	138	63.123	119	27.73	26
15.3	18.101	258	66.27	88	63.001	122	27.34	39
25.3	17.838	263	66.63	36	62.880	121	26.83	51
Dec. 5.2	17.578	260	66.46	17	62.766	114	26.23	60
15.2	17.326	252	65.76	70	62.664	102	25.54	69
25.2	17.092	234	64.55	121	62.575	89	24.79	75
35.1	16.887	205	62.86	169	62.507	68	24.04	75
Mean Place	15.280		28.38		59.227		2.49	
Sec δ, Tan δ	1.617		+1.271		1.000		+0.017	
$D_\psi\alpha$, $D_\omega\alpha$	+0.05		−0.08		+0.06		0.00	
$D_\psi\delta$, $D_\omega\delta$	+0.4		−0.4		+0.4		−0.4	

Washington Mean Time.	σ Aquarii. Mag. 4.9				α Lacertæ. Mag. 3.8			
	Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 22 26		° ′ −11 6		h m 22 27		° ′ +49 50	
	s		″		s		″	
Jan. 1.2	12.382		31.16		48.873		76.08	
11.1	12.327	55	31.43	27	48.696	177	74.23	185
21.1	12.296	31	31.59	16	48.553	143	72.02	221
31.1	12.289	7	31.61	2	48.453	100	69.54	248
Feb. 10.0	12.310	21	31.47	14	48.400	53	66.87	267
20.0	12.359	49	31.15	32	48.401	1	64.15	272
Mar. 1.0	12.440	81	30.65	50	48.457	56	61.48	267
11.0	12.553	113	29.92	73	48.572	115	58.98	250
20.9	12.698	145	28.99	93	48.745	173	56.76	222
30.9	12.877	179	27.83	116	48.976	231	54.89	187
Apr. 9.9	13.089	212	26.48	135	49.261	285	53.48	141
19.9	13.331	242	24.94	154	49.591	330	52.58	90
29.8	13.601	270	23.22	172	49.961	370	52.21	37
May 9.8	13.893	292	21.39	183	50.362	401	52.40	19
19.8	14.204	311	19.47	192	50.780	418	53.15	75
29.7	14.524	320	17.52	195	51.208	428	54.43	128
June 8.7	14.847	323	15.59	193	51.632	424	56.20	177
18.7	15.165	318	13.72	187	52.042	410	58.42	222
28.7	15.471	306	11.96	176	52.426	384	61.03	261
July 8.6	15.757	286	10.37	159	52.776	350	63.94	291
18.6	16.013	256	8.96	141	53.083	307	67.12	318
28.6	16.235	222	7.78	118	53.340	257	70.46	334
Aug. 7.6	16.419	184	6.83	95	53.542	202	73.90	344
17.5	16.562	143	6.14	69	53.687	145	77.36	346
27.5	16.659	97	5.69	45	53.771	84	80.79	343
Sept. 6.5	16.712	53	5.49	20	53.798	27	84.10	331
16.4	16.724	12	5.49	0	53.770	28	87.22	312
26.4	16.698	26	5.69	20	53.690	80	90.11	289
Oct. 6.4	16.638	60	6.04	35	53.564	126	92.69	258
16.4	16.550	88	6.51	47	53.399	165	94.93	224
26.3	16.443	107	7.06	55	53.203	196	96.76	183
Nov. 5.3	16.323	120	7.67	61	52.982	221	98.15	139
15.3	16.198	125	8.29	62	52.746	236	99.07	92
25.3	16.072	126	8.90	61	52.502	244	99.48	41
Dec. 5.2	15.955	117	9.48	58	52.258	244	99.37	11
15.2	15.849	106	10.00	52	52.022	236	98.74	63
25.2	15.759	90	10.44	44	51.803	219	97.60	114
35.1	15.689	70	10.80	36	51.606	197	96.01	159
Mean Place	12.213		29.24		49.732		60.97	
Sec δ, Tan δ	1.019		−0.196		1.551		+1.186	
$D_\psi\alpha$, $D_\omega\alpha$	+0.06		+0.01		+0.05		−0.07	
$D_\psi\delta$, $D_\omega\delta$	+0.4		−0.4		+0.4		−0.4	

Washington Mean Time.	υ Aquarii. Mag. 5.3				226 B. Cephei. Mag. 5.7				η Aquarii. Mag. 4.1				10 Lacertæ. Mag. 4.9			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 22 30		° ′ −21 7		h m 22 30		° ′ +75 47		h m 22 31		° ′ − 0 32		h m 22 35		° ′ +38 36	
	s		″		s		″		s		″		s		″	
Jan. 1.2	6.254		85.13		44.24		55.91		2.540		61.44		28.989		58.70	
11.1	6.193	61	85.00	13	43.56	68	54.21	170	2.481	59	62.13	69	28.862	127	57.03	167
21.1	6.156	37	84.65	35	42.98	58	52.03	218	2.444	37	62.79	66	28.761	101	55.07	196
31.1	6.145	11	84.12	53	42.52	46	49.42	261	2.431	13	63.38	59	28.693	68	52.88	219
Feb. 10.1	6.163	18	83.38	74	42.21	31	46.50	292	2.445	14	63.86	48	28.661	32	50.58	230
20.0	6.210	47	82.45	93	42.05	16	43.40	310	2.486	41	64.19	33	28.670	9	48.26	232
Mar. 1.0	6.290	80	81.31	114	42.06	1	40.25	315	2.558	72	64.33	14	28.723	53	46.01	225
11.0	6.404	114	79.99	132	42.23	17	37.16	309	2.663	105	64.25	8	28.822	99	43.95	206
20.9	6.551	147	78.49	150	42.56	33	34.29	287	2.800	137	63.93	32	28.969	147	42.16	179
30.9	6.733	182	76.82	167	43.05	49	31.72	257	2.972	172	63.34	59	29.163	194	40.71	145
Apr. 9.9	6.950	217	75.01	181	43.68	63	29.58	214	3.177	205	62.48	86	29.401	238	39.70	101
19.9	7.198	248	73.09	192	44.42	74	27.91	167	3.413	236	61.34	114	29.680	279	39.15	55
29.8	7.475	277	71.09	200	45.26	84	26.81	110	3.678	265	59.96	138	29.994	314	39.10	5
May 9.8	7.777	302	69.06	203	46.16	90	26.29	52	3.965	287	58.36	160	30.337	343	39.55	45
19.8	8.097	320	67.04	202	47.10	94	26.36	7	4.270	305	56.57	179	30.698	361	40.52	97
29.8	8.429	332	65.09	195	48.05	95	27.06	70	4.586	316	54.64	193	31.070	372	41.93	141
June 8.7	8.766	337	63.25	184	48.98	93	28.34	128	4.904	318	52.62	202	31.442	372	43.78	185
18.7	9.098	332	61.57	168	49.87	89	30.14	180	5.219	315	50.57	205	31.805	363	46.01	223
28.7	9.419	321	60.09	148	50.69	82	32.44	230	5.520	301	48.53	204	32.149	344	48.56	255
July 8.6	9.718	299	58.87	122	51.42	73	35.19	275	5.801	281	46.56	197	32.466	317	51.36	280
18.6	9.989	271	57.89	98	52.04	62	38.32	313	6.054	253	44.70	186	32.749	283	54.34	298
28.6	10.226	237	57.20	69	52.55	51	41.72	340	6.274	220	43.01	169	32.990	241	57.45	311
Aug. 7.6	10.423	197	56.79	41	52.92	37	45.34	362	6.456	182	41.49	152	33.186	196	60.59	314
17.5	10.575	152	56.67	12	53.16	24	49.10	376	6.598	142	40.19	130	33.334	148	63.72	313
27.5	10.681	106	56.82	15	53.26	10	52.93	383	6.695	97	39.12	107	33.430	96	66.76	304
Sept. 6.5	10.741	60	57.21	39	53.22	4	56.75	382	6.753	58	38.27	85	33.476	46	69.66	290
16.4	10.756	15	57.79	58	53.05	17	60.49	374	6.768	15	37.66	61	33.476	0	72.38	272
26.4	10.730	26	58.54	75	52.74	31	64.05	356	6.746	22	37.26	40	33.432	44	74.84	246
Oct. 6.4	10.668	62	59.39	85	52.32	42	67.35	330	6.692	54	37.08	18	33.349	83	77.01	217
16.4	10.577	91	60.31	92	51.79	53	70.33	298	6.612	80	37.07	1	33.232	117	78.85	184
26.3	10.462	115	61.24	93	51.16	63	72.93	260	6.512	100	37.22	15	33.089	143	80.34	149
Nov. 5.3	10.334	128	62.12	88	50.46	70	75.08	215	6.399	113	37.53	31	32.927	162	81.42	108
15.3	10.199	135	62.91	79	49.69	77	76.71	163	6.279	120	37.95	42	32.753	174	82.08	66
25.3	10.064	135	63.58	67	48.89	80	77.80	109	6.158	121	38.47	52	32.573	180	82.30	22
Dec. 5.2	9.935	129	64.12	54	48.07	82	78.25	45	6.046	112	39.06	59	32.393	180	82.08	22
15.2	9.820	115	64.48	36	47.25	82	78.08	17	5.942	104	39.72	66	32.220	173	81.41	67
25.2	9.720	100	64.66	18	46.47	78	77.31	77	5.851	91	40.42	70	32.060	160	80.32	109
35.1	9.642	78	64.65	1	45.74	73	75.96	135	5.778	73	41.13	71	31.917	143	78.86	146
Mean Place	6.015		80.46		48.168		36.47		2.420		62.80		29.414		45.76	
Sec δ, Tan δ	1.072		−0.387		4.076		+3.952		1.000		−0.009		1.280		+0.799	
$D_\psi \alpha$, $D_\omega \alpha$	+0.06		+0.02		+0.02		−0.24		+0.06		0.00		+0.05		−0.05	
$D_\psi \delta$, $D_\omega \delta$	+0.4		−0.4		+0.4		−0.4		+0.4		−0.4		+0.4		−0.4	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ε Piscis Australis. Mag. 4.2				ζ Pegasi. Mag. 3.6				β Gruis. Mag. 2.2				η Pegasi. Mag. 3.1			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	22 36		−27 28		22 37		+10 23		22 37		−47 19		22 39		+29 46	
	s		″		s		″		s		″		s		″	
Jan. 1.2	1.017	73	62.52	40	16.385	68	37.85	105	39.771	125	38.55	124	3.546	101	64.05	151
11.1	0.944	49	62.12	65	16.317	49	36.80	110	39.646	91	37.31	159	3.445	78	62.54	174
21.1	0.895	19	61.47	88	16.268	24	35.70	111	39.555	50	35.72	192	3.367	52	60.80	188
31.1	0.876 —	10	60.59	111	16.244 —	1	34.59	106	39.505	9	33.80	220	3.315	20	58.92	196
Feb. 10.1	0.886	40	59.48	132	16.245	31	33.53	96	39.496 —	34	31.60	243	3.295 —	15	56.96	195
20.0	0.926	75	58.16	152	16.276	63	32.57	79	39.530	79	29.17	262	3.310	54	55.01	185
Mar. 1.0	1.001	110	56.64	171	16.339	95	31.78	59	39.609	125	26.55	274	3.364	92	53.16	165
11.0	1.111	145	54.93	187	16.434	132	31.19	31	39.734	172	23.81	282	3.456	136	51.51	138
20.9	1.256	182	53.06	200	16.566	167	30.88	1	39.906	218	20.99	285	3.592	178	50.13	103
30.9	1.438	218	51.06	211	16.733	202	30.87 —	31	40.124	263	18.14	281	3.770	219	49.10	64
Apr. 9.9	1.656	252	48.95	217	16.935	235	31.18	66	40.387	305	15.33	274	3.989	256	48.46	20
19.9	1.908	282	46.78	219	17.170	264	31.84	98	40.692	343	12.59	258	4.245	288	48.26 —	25
29.8	2.190	309	44.59	217	17.434	288	32.82	131	41.035	375	10.01	240	4.533	315	48.51	70
May 9.8	2.499	329	42.42	208	17.722	308	34.13	159	41.410	402	7.61	214	4.848	334	49.21	114
19.8	2.828	342	40.34	198	18.030	317	35.72	183	41.812	418	5.47	185	5.182	346	50.35	156
29.8	3.170	348	38.36	180	18.347	322	37.55	203	42.230	425	3.62	149	5.528	347	51.91	191
June 8.7	3.518	346	36.56	158	18.669	317	39.58	218	42.655	423	2.13	112	5.875	341	53.82	223
18.7	3.864	335	34.98	133	18.986	303	41.76	226	43.078	410	1.01	72	6.216	326	56.05	248
28.7	4.199	313	33.65	102	19.289	284	44.02	228	43.488	385	0.29	29	6.542	301	58.53	268
July 8.6	4.512	286	32.63	73	19.573	256	46.30	227	43.873	350	0.00 —	13	6.843	271	61.21	280
18.6	4.798	251	31.90	41	19.829	223	48.57	218	44.223	307	0.13	53	7.114	234	64.01	285
28.6	5.049	209	31.49	8	20.052	186	50.75	205	44.530	257	0.66	92	7.348	192	66.86	286
Aug. 7.6	5.258	163	31.41 —	22	20.238	145	52.80	190	44.787	198	1.58	127	7.540	147	69.72	280
17.5	5.421	116	31.63	49	20.383	101	54.70	170	44.985	137	2.85	156	7.687	101	72.52	268
27.5	5.537	66	32.12	75	20.484	59	56.40	150	45.122	74	4.41	177	7.788	56	75.20	251
Sept. 6.5	5.603	20	32.87	94	20.543	19	57.90	125	45.196	12	6.18	193	7.844	11	77.71	231
16.5	5.623 —	24	33.81	108	20.562 —	18	59.15	103	45.208 —	47	8.11	199	7.855 —	29	80.02	206
26.4	5.599	64	34.89	117	20.544	50	60.18	77	45.161	99	10.10	198	7.826	65	82.08	177
Oct. 6.4	5.535	94	36.06	119	20.494	78	60.95	54	45.062	143	12.08	186	7.761	94	83.85	148
16.4	5.441	121	37.25	115	20.416	98	61.49	30	44.919	180	13.94	167	7.667	118	85.33	114
26.3	5.320	137	38.40	105	20.318	112	61.79	8	44.739	206	15.61	140	7.549	135	86.47	78
Nov. 5.3	5.183	145	39.45	91	20.206	120	61.87 —	14	44.533	219	17.01	107	7.414	146	87.25	42
15.3	5.038	146	40.36	72	20.086	122	61.73	36	44.314	222	18.08	69	7.268	151	87.67	5
25.3	4.892	142	41.08	51	19.964	118	61.37	54	44.092	215	18.77	28	7.117	150	87.72 —	33
Dec. 5.2	4.750	129	41.59	27	19.846	111	60.83	73	43.877	201	19.05 —	14	6.967	144	87.39	70
15.2	4.621	112	41.86	3	19.735	98	60.10	87	43.676	179	18.91	57	6.823	132	86.69	104
25.2	4.509	92	41.89 —	24	19.637	83	59.23	99	43.497	149	18.34	97	6.691	116	85.65	135
35.2	4.417		41.65		19.554		58.24		43.348		17.37		6.575		84.30	
Mean Place	0.724		56.21		16.334		32.93		39.444		27.71		3.756		53.28	
Sec δ, Tan δ	1.127		−0.520		1.017		+0.183		1.475		−1.085		1.152		+0.572	
$D_\psi a$, $D_\omega a$	+0.07		+0.03		+0.06		−0.01		+0.07		+0.07		+0.06		−0.04	
, $D_\omega \delta$	+0.4		−0.4		+0.4		−0.4		+0.4		−0.4		+0.4		−0.3	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	λ Pegasi. Mag. 4.1				ε Gruis. Mag. 3.7				τ Aquarii. Mag. 4.2				μ Pegasi. Mag. 3.7			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	22 42		+23 7		22 43		−51 45		22 45		−14 1		22 45		+24 9	
	s		″		s		″		s		″		s		″	
Jan. 1.2	28.918	90	32.88	135	29.556	153	43.31	136	9.059	67	72.76	18	56.783	93	37.31	134
11.1	28.828	68	31.53	153	29.403	115	41.95	177	8.992	48	72.94	3	56.690	71	35.97	153
21.1	28.760	43	30.00	163	29.288	72	40.18	211	8.944	23	72.97	14	56.619	48	34.44	166
31.1	28.717	14	28.37	167	29.216	27	38.07	239	8.921	2	72.83	32	56.571	18	32.78	170
Feb. 10.1	28.703	17	26.70	162	29.189	21	35.68	265	8.923	31	72.51	50	56.553	14	31.08	165
20.0	28.720	53	25.08	150	29.210	70	33.03	282	8.954	61	72.01	72	56.567	48	29.43	155
Mar. 1.0	28.773	89	23.58	131	29.280	121	30.21	295	9.015	93	71.29	92	56.615	87	27.88	135
11.0	28.862	129	22.27	103	29.401	172	27.26	302	9.108	127	70.37	114	56.702	126	26.53	109
20.9	28.991	169	21.24	70	29.573	223	24.24	303	9.235	162	69.23	133	56.828	166	25.44	76
30.9	29.160	207	20.54	33	29.796	272	21.21	298	9.397	197	67.90	153	56.994	206	24.68	40
Apr. 9.9	29.367	243	20.21	7	30.068	319	18.23	286	9.594	229	66.37	171	57.200	240	24.28	0
19.9	29.610	274	20.28	48	30.387	361	15.37	270	9.823	260	64.66	184	57.440	274	24.28	43
29.8	29.884	301	20.76	90	30.748	397	12.67	247	10.083	285	62.82	195	57.714	301	24.71	84
May 9.8	30.185	320	21.66	129	31.145	426	10.20	218	10.368	307	60.87	200	58.015	320	25.55	124
19.8	30.505	332	22.95	164	31.571	445	8.02	187	10.675	319	58.87	201	58.335	333	26.79	160
29.8	30.837	335	24.59	195	32.016	455	6.15	148	10.994	326	56.86	198	58.668	338	28.39	192
June 8.7	31.172	331	26.54	221	32.471	454	4.67	107	11.320	325	54.88	189	59.006	332	30.31	220
18.7	31.503	317	28.75	242	32.925	439	3.60	63	11.645	315	52.99	175	59.338	320	32.51	240
28.7	31.820	294	31.17	256	33.364	416	2.97	19	11.960	296	51.24	155	59.658	298	34.91	257
July 8.6	32.114	266	33.73	263	33.780	380	2.78	26	12.256	271	49.69	135	59.956	270	37.48	264
18.6	32.380	233	36.36	264	34.160	335	3.04	69	12.527	240	48.34	109	60.226	236	40.12	267
28.6	32.613	191	39.00	260	34.495	279	3.73	110	12.767	202	47.25	84	60.462	196	42.79	264
Aug. 7.6	32.804	150	41.60	251	34.774	219	4.83	144	12.969	161	46.41	57	60.658	154	45.43	255
17.5	32.954	105	44.11	237	34.993	153	6.27	175	13.130	117	45.84	29	60.812	110	47.98	242
27.5	33.059	61	46.48	219	35.146	83	8.02	198	13.247	72	45.55	6	60.922	66	50.40	224
Sept. 6.5	33.120	20	48.67	197	35.229	17	10.00	213	13.319	31	45.49	19	60.988	23	52.64	203
16.5	33.140	20	50.64	173	35.246	49	12.13	218	13.350	10	45.68	37	61.011	17	54.67	180
26.4	33.120	52	52.37	146	35.197	107	14.31	214	13.340	44	46.05	53	60.994	50	56.47	151
Oct. 6.4	33.068	83	53.83	117	35.090	158	16.45	202	13.296	74	46.58	64	60.944	80	57.98	123
16.4	32.985	105	55.00	88	34.932	199	18.47	181	13.222	96	47.22	72	60.864	103	59.21	94
26.3	32.880	122	55.88	55	34.733	228	20.28	150	13.126	113	47.94	75	60.761	121	60.15	60
Nov. 5.3	32.758	131	56.43	24	34.505	246	21.78	114	13.013	122	48.69	74	60.640	131	60.75	28
15.3	32.627	135	56.67	9	34.259	253	22.92	72	12.891	124	49.43	68	60.509	136	61.03	2
25.3	32.492	135	56.58	39	34.006	248	23.64	28	12.767	120	50.11	62	60.373	136	61.01	38
Dec. 5.2	32.357	128	56.19	70	33.758	233	23.92	18	12.647	111	50.73	53	60.237	130	60.63	68
15.2	32.229	116	55.49	98	33.525	210	23.74	65	12.536	99	51.26	41	60.107	119	59.95	96
25.2	32.113	103	54.51	124	33.315	180	23.09	109	12.437	83	51.67	28	59.988	106	58.99	123
35.2	32.010		53.27		33.135		22.00		12.354		51.95		59.882		57.76	
Mean Place	28.996		23.87		29.198		31.65		8.778		70.37		56.855		27.86	
Sec δ, Tan δ	1.088		+0.427		1.615		−1.269		1.031		−0.250		1.096		+0.449	
Dψ α, Dω α	+0.06		−0.03		+0.07		+0.08		+0.06		+0.02		+0.06		−0.03	
Dψ δ, Dω δ	+0.4		−0.3		+0.4		−0.3		+0.4		−0.3		+0.4		−0.3	

Washington Mean Time.	*ι* Cephei. Mag. 3.7				*λ* Aquarii. Mag. 3.8				*ρ* Indi. Mag. 6.1				*δ* Aquarii. Mag. 3.5			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 22 46		° ′ +65 45		h m 22 48		° ′ − 8 1		h m 22 48		° ′ −70 30		h m 22 50		° ′ −16 15	
	s		″		s		″		s		″		s		″	
Jan. 1.2	39.46		49.40		14.243		37.30		49.97		96.29		11.942		67.16	
11.1	39.09	37	47.79	161	14.176	67	37.71	41	49.58	39	94.27	202	11.869	73	67.27	11 —
21.1	38.77	32	45.69	210	14.127	49	38.02	31	49.27	31	91.79	248	11.816	53	67.20	7
31.1	38.52	25	43.19	250	14.102	25	38.19	17	49.05	22	88.94	285	11.788	28	66.95	25
Feb. 10.1	38.34	18	40.40	279	14.100	2 —	38.22	3 —	48.92	13	85.76	318	11.784	4 —	66.51	44
20.0	38.24	10	37.43	297	14.127	27	38.08	14	48.87	5 —	82.37	339	11.809	25	65.86	65
Mar. 1.0	38.24	0	34.40	303	14.183	56	37.73	35	48.94	7	78.81	356	11.865	56	65.01	85
11.0	38.33	9	31.44	296	14.270	87	37.18	55	49.08	14	75.19	362	11.952	87	63.95	106
21.0	38.53	20	28.67	277	14.393	123	36.40	78	49.34	26	71.58	361	12.075	123	62.68	127
30.9	38.82	29	26.21	246	14.550	157	35.39	101	49.68	34	68.06	352	12.234	159	61.21	147
Apr. 9.9	39.19	37	24.15	206	14.740	190	34.13	126	50.11	43	64.68	338	12.426	192	59.55	166
19.9	39.64	45	22.57	158	14.965	225	32.67	146	50.62	51	61.54	314	12.653	227	57.75	180
29.8	40.15	51	21.53	104	15.221	256	31.02	165	51.20	58	58.67	287	12.912	259	55.82	193
May 9.8	40.71	56	21.07	46 —	15.501	280	29.21	181	51.85	65	56.16	251	13.197	285	53.80	202
19.8	41.31	60	21.20	13	15.803	302	27.28	193	52.56	71	54.06	210	13.504	307	51.74	206
29.8	41.92	61	21.91	71	16.118	315	25.28	200	53.28	72	52.40	166	13.826	322	49.69	205
June 8.7	42.53	61	23.19	128	16.440	322	23.26	202	54.04	76	51.24	116	14.154	328	47.71	198
18.7	43.13	60	24.99	180	16.760	320	21.28	198	54.79	75	50.57	67	14.482	328	45.83	188
28.7	43.69	56	27.28	229	17.070	310	19.38	190	55.51	72	50.43	14 —	14.802	320	44.13	170
July 8.7	44.20	51	29.99	271	17.364	294	17.60	178	56.19	68	50.81	38	15.103	301	42.62	151
18.6	44.65	45	33.06	307	17.632	268	16.01	159	56.82	63	51.70	89	15.380	277	41.35	127
28.6	45.02	37	36.40	334	17.869	237	14.62	139	57.38	56	53.08	138	15.625	245	40.33	102
Aug. 7.6	45.33	31	39.95	355	18.069	200	13.47	115	57.84	46	54.87	179	15.833	208	39.60	73
17.5	45.54	21	43.64	369	18.229	160	12.55	92	58.20	36	57.03	216	15.999	166	39.14	46
27.5	45.67	13	47.37	373	18.346	117	11.90	65	58.43	23	59.48	245	16.121	122	38.97	17 —
Sept. 6.5	45.72	5 —	51.09	372	18.420	74	11.48	42	58.55	12	62.13	265	16.199	78	39.05	8
16.5	45.69	3	54.71	362	18.453	33 —	11.30	18 —	58.55	0	64.87	274	16.234	35 —	39.37	32
26.4	45.58	11	58.15	344	18.448	5	11.33	3	58.42	13	67.60	273	16.230	4	39.87	50
Oct. 6.4	45.39	19	61.35	320	18.408	40	11.55	22	58.18	24	70.20	260	16.188	42	40.53	66
16.4	45.12	27	64.24	289	18.339	69	11.91	36	57.83	35	72.59	239	16.116	72	41.29	76
26.4	44.81	31	66.75	251	18.249	90	12.39	48	57.41	42	74.63	204	16.022	94	42.11	82
Nov. 5.3	44.45	36	68.82	207	18.143	106	12.95	56	56.92	49	76.25	162	15.909	113	42.94	83
15.3	44.06	39	70.39	157	18.028	115	13.56	61	56.39	53	77.38	113	15.787	122	43.74	80
25.3	43.63	43	71.42	103	17.910	118	14.19	63	55.83	56	77.97	59	15.662	125	44.47	73
Dec. 5.2	43.20	43	71.87	45 —	17.795	115	14.81	62	55.27	56	77.97	0	15.540	122	45.11	64
15.2	42.76	44	71.73	14	17.686	109	15.41	60	54.74	53	77.39	58	15.426	114	45.63	52
25.2	42.33	43	71.00	73	17.589	97	15.95	54	54.25	49	76.23	116	15.323	103	46.00	37
35.2	41.94	39	69.71	129	17.507	82	16.43	48	53.81	44	74.53	170	15.236	87	46.22	22
Mean Place	41.181		30.08		13.982		36.81		49.737		82.17		11.621		64.20	
Sec δ, Tan δ	2.436		+2.221		1.010		−0.141		2.999		−2.827		1.042		−0.292	
$D_\psi \alpha$, $D_\omega \alpha$	+0.04		−0.14		+0.06		+0.01		+0.08		+0.18		+0.06		+0.02	
$D_\psi \delta$, $D_\omega \delta$	+0.4		−0.3		+0.4		−0.3		+0.4		−0.3		+0.4		−0.3	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α **Piscis Australis.** (*Fomalhaut.*) Mag. 1.3				o **Andromedæ.** Mag. 3.6				β **Pegasi.** Var. 2.2–2.7				α **Pegasi.** (*Markab.*) Mag. 2.6			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 22 53		° ′ −30 3		h m 22 58		° ′ +41 52		h m 22 59		° ′ +27 37		h m 23 0		° ′ +14 45	
	s		″		s		″		s		″		s		″	
Jan. 1.2	1.123	90	70.84	42	2.826	152	42.45	150	41.965	107	47.88	131	34.651	85	18.26	107
11.1	1.033	66	70.42	71	2.674	129	40.95	185	41.858	88	46.57	155	34.566	68	17.19	118
21.1	0.967	40	69.71	97	2.545	101	39.10	211	41.770	64	45.02	170	34.498	48	16.01	123
31.1	0.927	11	68.74	123	2.444	64	36.99	229	41.706	36	43.32	179	34.450	22	14.78	122
Feb. 10.1	0.916	— 21	67.51	146	2.380	23	34.70	236	41.670	5	41.53	178	34.428	— 5	13.56	114
20.0	0.937	55	66.05	168	2.357	— 22	32.34	234	41.665	— 32	39.75	170	34.433	37	12.42	102
Mar. 1.0	0.992	90	64.37	187	2.379	72	30.00	222	41.697	72	38.05	154	34.470	72	11.40	84
11.0	1.082	128	62.50	205	2.451	122	27.78	198	41.769	113	36.51	128	34.542	109	10.56	57
21.0	1.210	166	60.45	218	2.573	174	25.80	166	41.882	155	35.23	98	34.651	147	9.99	28
30.9	1.376	205	58.27	227	2.747	225	24.14	128	42.037	197	34.25	61	34.798	184	9.71	— 4
Apr. 9.9	1.581	240	56.00	234	2.972	270	22.86	83	42.234	236	33.64	20	34.982	221	9.75	40
19.9	1.821	275	53.66	235	3.242	311	22.03	34	42.470	272	33.44	— 22	35.203	254	10.15	76
29.8	2.096	305	51.31	231	3.553	344	21.69	— 16	42.742	302	33.66	65	35.457	281	10.91	109
May 9.8	2.401	328	49.00	222	3.897	369	21.85	66	43.044	324	34.31	107	35.738	304	12.00	141
19.8	2.729	345	46.78	207	4.266	384	22.51	116	43.368	339	35.38	145	36.042	318	13.41	171
29.8	3.074	355	44.71	189	4.650	389	23.67	161	43.707	345	36.83	182	36.360	326	15.12	194
June 8.7	3.429	353	42.82	162	5.039	385	25.28	202	44.052	343	38.65	212	36.686	325	17.06	214
18.7	3.782	346	41.20	137	5.424	369	27.30	237	44.395	332	40.77	236	37.011	315	19.20	227
28.7	4.128	329	39.83	105	5.793	345	29.67	268	44.727	311	43.13	256	37.326	297	21.47	234
July 8.7	4.457	302	38.78	71	6.138	312	32.35	290	45.038	285	45.69	268	37.623	274	23.81	237
18.6	4.759	268	38.07	36	6.450	272	35.25	308	45.323	251	48.37	274	37.897	241	26.18	233
28.6	5.027	228	37.71	3	6.722	228	38.33	316	45.574	212	51.11	274	38.138	206	28.51	224
Aug. 7.6	5.255	184	37.68	— 31	6.950	179	41.49	319	45.786	169	53.85	269	38.344	167	30.75	211
17.5	5.439	135	37.99	62	7.129	128	44.68	315	45.955	125	56.54	258	38.511	124	32.86	195
27.5	5.574	86	38.61	88	7.257	78	47.83	304	46.080	81	59.12	243	38.635	83	34.81	176
Sept. 6.5	5.660	38	39.49	109	7.335	28	50.87	290	46.161	38	61.55	224	38.718	42	36.57	153
16.5	5.698	— 8	40.58	126	7.363	— 18	53.77	267	46.199	— 2	63.79	200	38.760	4	38.10	129
26.4	5.690	48	41.84	135	7.345	61	56.44	242	46.197	39	65.79	173	38.764	— 30	39.39	105
Oct. 6.4	5.642	85	43.19	137	7.284	96	58.86	211	46.158	70	67.52	147	38.734	58	40.44	79
16.4	5.557	112	44.56	133	7.188	129	60.97	176	46.088	95	68.99	114	38.676	83	41.23	55
26.4	5.445	131	45.89	122	7.059	152	62.73	138	45.993	116	70.13	81	38.593	100	41.78	28
Nov. 5.3	5.314	144	47.11	106	6.907	171	64.11	95	45.877	129	70.94	49	38.493	111	42.06	6
15.3	5.170	149	48.17	86	6.736	182	65.06	50	45.748	136	71.43	13	38.382	119	42.12	— 20
25.3	5.021	147	49.03	61	6.554	187	65.56	5	45.612	140	71.56	— 22	38.263	119	41.92	43
Dec. 5.2	4.874	139	49.64	33	6.367	187	65.61	— 41	45.472	137	71.34	56	38.144	114	41.49	64
15.2	4.735	124	49.97	6	6.180	179	65.20	86	45.335	130	70.78	87	38.030	109	40.85	83
25.2	4.611	106	50.03	— 22	6.001	165	64.34	128	45.205	118	69.91	117	37.921	97	40.02	100
35.2	4.505		49.81		5.836		63.06		45.087		68.74		37.824		39.02	
Mean Place	0.729		64.01		3.161		27.39		42.002		36.74		34.516		11.08	
Sec δ, Tan δ	1.155		−0.579		1.343		+0.897		1.129		+0.524		1.034		+0.263	
$D_\psi\, a$, $D_\omega\, a$	+0.06		+0.04		+0.05		−0.06		+0.06		−0.03		+0.06		−0.02	
$D_\psi\, \delta$, $D_\omega\, \delta$	+0.4		−0.3		+0.4		−0.3		+0.4		−0.3		+0.4		−0.3	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	**55 Pegasi.** Mag. 4.7				**c^2 Aquarii.** Mag. 3.8				**π Cephei.** Mag. 4.6				**ι Gruis.** Mag. 4.1			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 23 2		° ′ + 8 57		h m 23 4		° ′ −21 37		h m 23 5		° ′ +74 55		h m 23 5		° ′ −45 41	
	s		″		s		″		s		″		s		″	
Jan. 1.2	46.527	80	24.92	91	58.600	87	47.46	5	10.51	68	81.35	126	37.026	148	77.64	94
11.2	46.447	64	24.01	98	58.513	66	47.41	28	9.83	61	80.09	181	36.878	116	76.70	136
21.1	46.383	45	23.03	97	58.447	45	47.13	50	9.22	52	78.28	229	36.762	85	75.34	170
31.1	46.338	20	22.06	94	58.402	19	46.63	74	8.70	40	75.99	267	36.677	47	73.64	203
Feb. 10.1	46.318	7	21.12	82	58.383	8	45.89	96	8.30	26	73.32	293	36.630	8	71.61	230
20.0	46.325	37	20.30	69	58.391	40	44.93	119	8.04	10	70.39	309	36.622	33	69.31	253
Mar. 1.0	46.362	70	19.61	46	58.431	73	43.74	140	7.94	4	67.30	310	36.655	82	66.78	271
11.0	46.432	105	19.15	25	58.504	108	42.34	160	7.98	21	64.20	298	36.737	122	64.07	284
21.0	46.537	143	18.90	6	58.612	145	40.74	178	8.19	36	61.22	276	36.859	171	61.23	290
30.9	46.680	181	18.96	36	58.757	183	38.96	194	8.55	49	58.46	241	37.030	221	58.33	291
Apr. 9.9	46.861	215	19.32	66	58.940	219	37.02	208	9.04	64	56.05	197	37.251	262	55.42	289
19.9	47.076	247	19.98	99	59.159	253	34.94	215	9.68	73	54.08	148	37.513	306	52.53	278
29.9	47.323	276	20.97	128	59.412	282	32.79	220	10.41	81	52.60	91	37.819	342	49.75	263
May 9.8	47.599	298	22.25	156	59.694	307	30.59	220	11.22	88	51.69	34	38.161	374	47.12	241
19.8	47.897	313	23.81	179	60.001	324	28.39	212	12.10	91	51.35	26	38.535	395	44.71	212
29.8	48.210	321	25.60	198	60.325	334	26.27	203	13.01	91	51.61	84	38.930	410	42.59	181
June 8.7	48.531	320	27.58	213	60.659	337	24.24	187	13.92	89	52.45	141	39.340	414	40.78	145
18.7	48.851	314	29.71	219	60.996	331	22.37	165	14.81	85	53.86	193	39.754	405	39.33	104
28.7	49.165	296	31.90	223	61.327	315	20.72	141	15.66	79	55.79	241	40.159	389	38.29	64
July 8.7	49.461	272	34.13	220	61.642	292	19.31	113	16.45	70	58.20	281	40.548	363	37.65	16
18.6	49.733	241	36.33	212	61.934	262	18.18	82	17.15	59	61.01	317	40.911	324	37.49	24
28.6	49.974	206	38.45	199	62.196	225	17.36	52	17.74	49	64.18	345	41.235	278	37.73	67
Aug. 7.6	50.180	169	40.44	184	62.421	184	16.84	19	18.23	38	67.63	364	41.513	226	38.40	106
17.6	50.349	127	42.28	164	62.605	141	16.65	10	18.61	24	71.27	378	41.739	169	39.46	139
27.5	50.476	86	43.92	142	62.746	95	16.75	39	18.85	11	75.05	383	41.908	110	40.85	167
Sept. 6.5	50.562	45	45.34	120	62.841	50	17.14	61	18.96	2	78.88	380	42.018	51	42.52	188
16.5	50.607	9	46.54	97	62.891	8	17.75	83	18.94	14	82.68	369	42.069	10	44.40	201
26.4	50.616	28	47.51	74	62.899	31	18.58	96	18.80	26	86.37	350	42.059	61	46.41	205
Oct. 6.4	50.588	55	48.25	49	62.868	64	19.54	104	18.54	36	89.87	327	41.998	110	48.46	198
16.4	50.533	78	48.74	27	62.804	89	20.58	109	18.18	48	93.14	291	41.888	145	50.44	187
26.4	50.455	95	49.01	5	62.715	110	21.67	105	17.70	56	96.05	252	41.743	178	52.31	164
Nov. 5.3	50.360	108	49.06	13	62.605	123	22.72	98	17.14	63	98.57	204	41.565	196	53.95	134
15.3	50.252	111	48.93	33	62.482	129	23.70	86	16.51	69	100.61	151	41.369	207	55.29	98
25.3	50.141	115	48.60	49	62.353	129	24.56	70	15.82	73	102.12	93	41.162	209	56.27	60
Dec. 5.3	50.026	110	48.11	64	62.224	123	25.26	52	15.09	75	103.05	32	40.953	202	56.87	18
15.2	49.916	103	47.47	79	62.101	113	25.78	31	14.34	74	103.37	30	40.751	186	57.05	26
25.2	49.813	92	46.68	89	61.988	100	26.09	11	13.60	71	103.07	91	40.565	167	56.79	68
35.2	49.721		45.79		61.888		26.20		12.89		102.16		40.398		56.11	
Mean Place	46.322		19.55		58.174		43.16		13.335		59.63		36.516		67.14	
Sec δ, Tan δ	1.012		+0.158		1.076		−0.396		3.848		+3.716		1.432		−1.025	
$D_\psi \alpha$, $D_\omega \alpha$	+0.06		−0.01		+0.06		+0.03		+0.04		−0.24		+0.07		+0.07	
$D_\psi \delta$, $D_\omega \delta$	+0.4		−0.2		+0.4		−0.2		+0.4		−0.2		+0.4		−0.2	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	59 Pegasi. Mag. 5.2				5 H^1. Cassiop. Mag. 5.6				φ Aquarii. Mag. 4.4				ψ Aquarii. Mag. 4.5			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 23 7		° ′ + 8 15		h m 23 9		° ′ +56 42		h m 23 9		° ′ − 6 29		h m 23 11		° ′ − 9 32	
	s		″		s		″		s		″		s		″	
Jan. 1.2	29.931		54.96		13.263		35.23		58.709		66.93		29.912		44.01	
11.2	29.849	82	54.07	89	13.010	253	33.85	138	58.630	79	67.42	49	29.834	78	44.39	38
21.1	29.781	68	53.14	93	12.787	223	31.99	186	58.564	66	67.78	36	29.769	65	44.64	25
31.1	29.734	47	52.21	93	12.604	183	29.76	223	58.521	43	68.04	26	29.725	44	44.75	11
Feb. 10.1	29.710	24	51.32	89	12.470	134	27.23	253	58.498	23	68.16	12	29.701	24	44.68	7
20.0	29.713	3	50.54	78	12.394	76	24.52	271	58.504	6	68.09	7	29.708	7	44.44	24
Mar. 1.0	29.745	32	49.91	63	12.382	12	21.75	277	58.536	32	67.84	25	29.739	31	44.00	44
11.0	29.809	64	49.47	44	12.441	59	19.02	273	58.602	66	67.36	48	29.803	64	43.34	66
21.0	29.912	103	49.27	20	12.571	130	16.46	256	58.701	99	66.67	69	29.903	100	42.45	89
30.9	30.049	137	49.36	9	12.775	204	14.17	229	58.837	136	65.72	95	30.037	134	41.33	112
Apr. 9.9	30.225	176	49.75	39	13.046	271	12.25	192	59.008	171	64.54	118	30.209	172	39.98	135
19.9	30.436	211	50.44	69	13.382	336	10.77	148	59.217	209	63.13	141	30.417	208	38.42	156
29.9	30.679	243	51.46	102	13.773	391	9.80	97	59.455	238	61.51	162	30.655	238	36.69	173
May 9.8	30.954	275	52.75	129	14.208	435	9.38	42	59.723	268	59.74	177	30.925	270	34.80	189
19.8	31.248	294	54.32	157	14.678	470	9.50	12	60.016	293	57.82	192	31.218	293	32.81	199
29.8	31.560	312	56.12	180	15.170	492	10.17	67	60.325	309	55.81	201	31.529	311	30.75	206
June 8.7	31.881	321	58.10	198	15.667	497	11.38	121	60.644	319	53.76	205	31.850	321	28.68	207
18.7	32.202	321	60.21	211	16.157	490	13.10	172	60.965	321	51.73	203	32.174	324	26.66	202
28.7	32.516	314	62.40	219	16.632	475	15.27	217	61.280	315	49.75	198	32.492	318	24.74	192
July 8.7	32.814	298	64.61	221	17.075	443	17.84	257	61.581	301	47.91	184	32.796	304	22.95	179
18.6	33.089	275	66.79	218	17.478	403	20.76	292	61.859	278	46.22	169	33.079	283	21.34	161
28.6	33.335	246	68.87	208	17.831	353	23.93	317	62.110	251	44.69	153	33.333	254	19.97	137
Aug. 7.6	33.544	209	70.83	196	18.128	297	27.30	337	62.325	215	43.42	127	33.553	220	18.82	115
17.6	33.717	173	72.63	180	18.362	234	30.81	351	62.504	179	42.40	102	33.733	180	17.96	86
27.5	33.849	132	74.24	161	18.535	173	34.37	356	62.643	139	41.62	78	33.874	141	17.35	61
Sept. 6.5	33.939	90	75.63	139	18.642	107	37.89	352	62.737	94	41.11	51	33.973	99	17.02	33
16.5	33.990	51	76.79	116	18.684	42	41.34	345	62.793	56	40.83	28	34.030	57	16.94	8
26.4	34.002	12	77.73	94	18.665	19	44.62	328	62.807	14	40.78	5	34.046	16	17.06	12
Oct. 6.4	33.979	23	78.42	69	18.590	75	47.69	307	62.789	18	40.94	16	34.029	17	17.39	33
16.4	33.929	50	78.89	47	18.462	128	50.45	276	62.739	50	41.27	33	33.980	49	17.85	46
26.4	33.855	74	79.12	23	18.289	173	52.88	243	62.667	72	41.73	46	33.907	73	18.45	60
Nov. 5.3	33.764	91	79.14	2	18.078	211	54.88	200	62.573	94	42.27	54	33.815	92	19.12	67
15.3	33.659	105	78.99	15	17.837	241	56.44	156	62.469	104	42.90	63	33.709	106	19.83	71
25.3	33.547	112	78.67	32	17.572	265	57.50	106	62.359	110	43.54	64	33.599	110	20.54	71
Dec. 5.3	33.435	112	78.17	50	17.293	279	58.04	54	62.247	112	44.20	66	33.485	114	21.23	69
15.2	33.325	110	77.52	65	17.008	285	58.01	3	62.137	110	44.85	65	33.375	110	21.86	63
25.2	33.222	103	76.76	76	16.727	281	57.44	57	62.037	100	45.47	62	33.273	102	22.42	56
35.2	33.128	94	75.90	86	16.460	267	56.35	109	61.945	92	46.02	55	33.181	92	22.88	46
Mean Place	29.692		49.65		14.017		16.13		58.342		67.44		29.521		43.58	
Sec δ, Tan δ	1.011		+0.145		1.822		+1.523		1.006		−0.114		1.014		−0.168	
$D_\psi \alpha$, $D_\omega \alpha$	+0.06		−0.01		+0.05		−0.10		+0.06		+0.01		+0.06		+0.01	
$D_\psi \delta$, $D_\omega \delta$	+0.4		−0.2		+0.4		−0.2		+0.4		−0.2		+0.4		−0.2	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Tucanæ. Mag. 4.1				γ Piscium. Mag. 3.8				γ Sculptoris. Mag. 4.5				ο Cephei. Mag. 4.9			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	23 12		−58 41		23 12		+ 2 49		23 14		−32 58		23 15		+67 38	
	s		″		s		″		s		″		s		″	
Jan. 1.2	32.610		61.29		48.938		26.96		17.966		90.85		8.76		87.76	
		242		137		81		74		111		41		43		125
11.2	32.368		59.92		48.857		26.22		17.855		90.44		8.33		86.51	
		201		183		65		71		91		74		39		175
21.1	32.167		58.09		48.792		25.51		17.764		89.70		7.94		84.76	
		156		224		47		68		66		105		33		223
31.1	32.011		55.85		48.745		24.83		17.698		88.65		7.61		82.53	
		105		260		24		60		38		133		26		259
Feb. 10.1	31.906		53.25		48.721	—	24.23		17.660		87.32		7.35		79.94	
		49		288		1		47		8		161		17		283
20.1	31.857	—	50.37		48.722		23.76		17.652	—	85.71		7.18		77.11	
		9		312		31		30		27		184		8		297
Mar. 1.0	31.866		47.25		48.753		23.46		17.679		83.87		7.10	—	74.14	
		69		327		62		11		63		206		3		299
11.0	31.935		43.98		48.815		23.35	—	17.742		81.81		7.13		71.15	
		131		335		97		15		102		223		14		287
21.0	32.066		40.63		48.912		23.50		17.844		79.58		7.27		68.28	
		195		337		134		40		142		237		24		264
30.9	32.261		37.26		49.046		23.90		17.986		77.21		7.51		65.64	
		255		332		171		68		184		248		34		230
Apr. 9.9	32.516		33.94		49.217		24.58		18.170		74.73		7.85		63.34	
		314		321		206		95		222		253		44		187
19.9	32.830		30.73		49.423		25.53		18.392		72.20		8.29		61.47	
		369		302		238		123		263		254		51		139
29.9	33.199		27.71		49.661		26.76		18.655		69.66		8.80		60.08	
		418		279		269		148		295		249		57		85
May 9.8	33.617		24.92		49.930		28.24		18.950		67.17		9.37		59.23	
		459		246		292		170		321		239		63		26
19.8	34.076		22.46		50.222		29.94		19.271		64.78		10.00		58.97	—
		490		210		310		188		345		223		65		29
29.8	34.566		20.36		50.532		31.82		19.616		62.55		10.65		59.26	
		508		170		319		201		357		201		66		90
June 8.8	35.074		18.66		50.851		33.83		19.973		60.54		11.31		60.16	
		516		124		321		209		361		174		65		141
18.7	35.590		17.42		51.172		35.92		20.334		58.80		11.96		61.57	
		510		76		315		211		356		146		63		195
28.7	36.100		16.66		51.487		38.03		20.690		57.34		12.59		63.52	
		490		27		299		209		343		110		59		241
July 8.7	36.590		16.39	—	51.786		40.12		21.033		56.24		13.18		65.93	
		457		23		280		202		319		74		53		278
18.6	37.047		16.62		52.066		42.14		21.352		55.50		13.71		68.71	
		412		72		250		189		289		36		47		314
28.6	37.459		17.34		52.316		44.03		21.641		55.14	—	14.18		71.85	
		356		117		217		171		251		1		38		339
Aug. 7.6	37.815		18.51		52.533		45.74		21.892		55.15		14.56		75.24	
		289		159		179		153		207		38		31		359
17.6	38.104		20.10		52.712		47.27		22.099		55.53		14.87		78.83	
		216		193		140		132		160		72		22		369
27.5	38.320		22.03		52.852		48.59		22.259		56.25		15.09		82.52	
		137		222		98		107		110		100		13		376
Sept. 6.5	38.457		24.25		52.950		49.66		22.369		57.25		15.22		86.28	
		58		241		57		85		60		126		4		370
16.5	38.515	—	26.66		53.007		50.51		22.429		58.51		15.26	—	89.98	
		20		250		20		59		13		144		5		359
26.5	38.495		29.16		53.027	—	51.10		22.442	—	59.95		15.21		93.57	
		94		249		14		39		32		154		13		340
Oct. 6.4	38.401		31.65		53.013		51.49		22.410		61.49		15.08		96.97	
		160		238		44		17		70		158		20		316
16.4	38.241		34.03		52.969		51.66	—	22.340		63.07		14.88		100.13	
		217		216		68		1		101		155		28		281
26.4	38.024		36.19		52.901		51.65		22.239		64.62		14.60		102.94	
		263		186		86		19		126		144		34		241
Nov. 5.3	37.761		38.05		52.815		51.46		22.113		66.06		14.26		105.35	
		295		146		99		33		143		125		38		197
15.3	37.466		39.51		52.716		51.13		21.970		67.31		13.88		107.32	
		314		102		107		47		152		103		43		143
25.3	37.152		40.53		52.609		50.66		21.818		68.34		13.45		108.75	
		319		52		108		55		155		76		45		89
Dec. 5.3	36.833		41.05	—	52.501		50.11		21.663		69.10		13.00		109.64	
		313		1		107		64		150		46		47		26
15.2	36.520		41.04		52.394		49.47		21.513		69.56		12.53		109.90	—
		295		54		101		72		141		13		47		31
25.2	36.225		40.50		52.293		48.75		21.372		69.69	—	12.06		109.59	
		266		104		90		74		127		21		45		89
35.2	35.959		39.46		52.203		48.01		21.245		69.48		11.61		108.70	
Mean Place	32.033		48.44		48.622		23.30		17.440		83.46		10.218		66.39	
Sec δ, Tan δ	1.924		−1.645		1.001		+0.049		1.192		−0.649		2.631		+2.433	
$D_\psi a$, $D_\omega a$	*+0.07*		+0.11		+0.06		0.00		+0.06		+0.04		+0.05		−0.16	
$D_\psi \delta$. $D_\omega \delta$	*+0.4*		*−0.2*		+0.4		−0.2		+0.4		−0.2		+0.4		−0.2	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	τ Pegasi. Mag. 4.6				b^1 Aquarii. Mag. 4.2				4 Cassiopeiæ. Mag. 5.2				υ Pegasi. Mag. 4.6			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	23 16		+23 16		23 18		−20 33		23 21		+61 49		23 21		+22 56	
	s		″		s		″		s		″		s		″	
Jan. 1.2	28.756		59.72		34.101		37.46		5.06		38.18		11.246		39.72	
		106		116		92		5		33		122		106		112
11.2	28.650		58.56		34.009		37.51	—	4.73		36.96		11.140		38.60	
		90		134		77		18		30		173		92		130
21.1	28.560		57.22		33.932		37.33		4.43		35.23		11.048		37.30	
		70		147		57		42		26		216		72		144
31.1	28.490		55.75		33.875		36.91		4.17		33.07		10.976		35.86	
		47		154		32		65		20		251		49		150
Feb. 10.1	28.443		54.21		33.843		36.26		3.97		30.56		10.927		34.36	
		16		154		4		88		13		273		20		150
20.1	28.427	—	52.67		33.839	—	35.38		3.84		27.83		10.907	—	32.86	
		17		146		22		112		5		286		13		142
Mar. 1.0	28.444		51.21		33.861		34.26		3.79	—	24.97		10.920		31.44	
		54		130		57		134		3		286		49		126
11.0	28.498		49.91		33.918		32.92		3.82		22.11		10.969		30.18	
		93		106		93		155		11		274		89		106
21.0	28.591		48.85		34.011		31.37		3.93		19.37		11.058		29.12	
		135		78		129		176		19		250		130		76
30.9	28.726		48.07		34.140		29.61		4.12		16.87		11.188		28.36	
		176		46		168		193		28		217		172		44
Apr. 9.9	28.902		47.61		34.308		27.68		4.40		14.70		11.360		27.92	
		217		7		206		205		35		175		213		7
19.9	29.119		47.54	—	34.514		25.63		4.75		12.95		11.573		27.85	—
		253		33		239		216		42		126		249		31
29.9	29.372		47.87		34.753		23.47		5.17		11.69		11.822		28.16	
		284		71		271		221		47		74		280		70
May 9.8	29.656		48.58		35.024		21.26		5.64		10.95		12.102		28.86	
		310		110		297		221		52		17		308		108
19.8	29.966		49.68		35.321		19.05		6.16		10.78	—	12.410		29.94	
		327		145		319		220		54		39		325		143
29.8	30.293		51.13		35.640		16.85		6.70		11.17		12.735		31.37	
		337		177		330		209		56		96		336		175
June 8.8	30.630		52.90		35.970		14.76		7.26		12.13		13.071		33.12	
		338		205		335		193		55		147		338		203
18.7	30.968		54.95		36.305		12.83		7.81		13.60		13.409		35.15	
		330		226		330		175		53		197		331		224
28.7	31.298		57.21		36.635		11.08		8.34		15.57		13.740		37.39	
		314		242		319		151		50		240		316		238
July 8.7	31.612		59.63		36.954		9.57		8.84		17.97		14.056		39.77	
		291		252		297		123		46		278		293		250
18.6	31.903		62.15		37.251		8.34		9.30		20.75		14.349		42.27	
		259		257		267		93		41		310		263		254
28.6	32.162		64.72		37.518		7.41		9.71		23.85		14.612		44.81	
		224		255		234		60		35		333		228		253
Aug. 7.6	32.386		67.27		37.752		6.81		10.06		27.18		14.840		47.34	
		185		248		195		31		27		351		190		246
17.6	32.571		69.75		37.947		6.50	—	10.33		30.69		15.030		49.80	
		142		236		153		3		21		360		148		235
27.5	32.713		72.11		38.100		6.53		10.54		34.29		15.178		52.15	
		100		221		107		31		12		363		105		218
Sept. 6.5	32.813		74.32		38.207		6.84		10.66		37.92		15.283		54.33	
		58		201		64		56		6		357		64		200
16.5	32.871		76.33		38.271		7.40		10.72	—	41.49		15.347		56.33	
		18		180		21		77		1		346		24		178
26.5	32.889	—	78.13		38.292	—	8.17		10.71		44.95		15.371	—	58.11	
		18		154		16		91		8		327		12		153
Oct. 6.4	32.871		79.67		38.276		9.08		10.63		48.22		15.359		59.64	
		48		127		51		105		14		300		43		127
16.4	32.823		80.94		38.225		10.13		10.49		51.22		15.316		60.91	
		76		100		78		109		20		267		70		100
26.4	32.747		81.94		38.147		11.22		10.29		53.89		15.246		61.91	
		95		70		100		109		24		229		91		70
Nov. 5.3	32.652		82.64		38.047		12.31		10.05		56.18		15.155		62.61	
		111		41		115		102		28		183		107		41
15.3	32.541		83.05		37.932		13.33		9.77		58.01		15.048		63.02	
		122		9		123		94		33		134		119		11
25.3	32.419		83.14	—	37.809		14.27		9.44		59.35		14.929		63.13	—
		126		20		125		78		34		80		124		19
Dec. 5.3	32.293		82.94		37.684		15.05		9.10		60.15		14.805		62.94	
		127		49		123		61		35		23		125		47
15.2	32.166		82.45		37.561		15.66		8.75		60.38	—	14.680		62.47	
		123		79		117		41		35		34		123		75
25.2	32.043		81.66		37.444		16.07		8.40		60.04		14.557		61.72	
		114		103		105		19		35		90		114		100
35.2	31.929		80.63		37.339		16.26		8.05		59.14		14.443		60.72	
Mean Place	28.620		49.19		33.608		33.70		5.941		17.45		11.076		29.14	
Sec δ, Tan δ	1.089		+0.430		1.068		−0.375		2.118		+1.867		1.086		+0.423	
Dψ α, Dω α	+0.06		−0.03		+0.06		+0.02		+0.05		−0.12		+0.06		−0.03	
Dψ δ, Dω δ	+0.4		−0.2		+0.4		−0.2		+0.4		−0.2		+0.4			

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	*κ* **Piscium.** Mag. 4.9				*θ* **Piscium.** Mag. 4.4				**70 Pegasi.** Mag. 4.7				*β* **Sculptoris.** Mag. 4.5			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 23 22		° ′ + 0 47		h m 23 23		° ′ + 5 55		h m 23 24		° ′ +12 17		h m 23 28		° ′ −38 16	
	s		″		s		″		s		″		s		″	
Jan. 1.2	37.970		47.66		42.728		8.02		54.611		56.48		28.864		67.85	
		86		68		91		80		94		92		137		50
11.2	37.884		46.98		42.637		7.22		54.517		55.56		28.727		67.35	
		71		65		74		82		80		101		115		88
21.1	37.813		46.33		42.563		6.40		54.437		54.55		28.612		66.47	
		55		58		58		80		62		105		91		123
31.1	37.758		45.75		42.505		5.60		54.375		53.50		28.521		65.24	
		34		49		37		74		42		103		61		156
Feb. 10.1	37.724		45.26		42.468		4.86		54.333		52.47		28.460		63.68	
		9		35		11		62		16		97		30		185
20.1	37.715	—	44.91		42.457	—	4.24		54.317	—	51.50		28.430	—	61.83	
		20		18		15		48		14		85		4		212
Mar. 1.0	37.735		44.73	—	42.472		3.76		54.331		50.65		28.434		59.71	
		50		2		50		28		47		66		44		234
11.0	37.785		44.75		42.522		3.48		54.378		49.99		28.478		57.37	
		86		27		84		7		84		44		86		252
21.0	37.871		45.02		42.606		3.41	—	54.462		49.55		28.564		54.85	
		123		51		123		22		122		16		129		266
30.9	37.994		45.53		42.729		3.63		54.584		49.39	—	28.693		52.19	
		161		78		162		50		161		14		174		274
Apr. 9.9	38.155		46.31		42.891		4.13		54.745		49.53		28.867		49.45	
		197		106		196		80		200		45		216		277
19.9	38.352		47.37		43.087		4.93		54.945		49.98		29.083		46.68	
		230		130		233		106		235		79		258		276
29.9	38.582		48.67		43.320		5.99		55.180		50.77		29.341		43.92	
		262		155		260		136		266		112		294		267
May 9.8	38.844		50.22		43.580		7.35		55.446		51.89		29.635		41.25	
		286		174		286		160		292		140		326		253
19.8	39.130		51.96		43.866		8.95		55.738		53.29		29.961		38.72	
		306		190		307		181		311		167		352		234
29.8	39.436		53.86		44.173		10.76		56.049		54.96		30.313		36.38	
		317		202		318		196		323		189		369		208
June 8.8	39.753		55.88		44.491		12.72		56.372		56.85		30.682		34.30	
		320		208		320		209		325		208		376		178
18.7	40.073		57.96		44.811		14.81		56.697		58.93		31.058		32.52	
		317		209		317		213		320		218		375		145
28.7	40.390		60.05		45.128		16.94		57.017		61.11		31.433		31.07	
		302		205		304		216		307		225		364		104
July 8.7	40.692		62.10		45.432		19.10		57.324		63.36		31.797		30.03	
		284		195		284		208		286		226		342		65
18.6	40.976		64.05		45.716		21.18		57.610		65.62		32.139		29.38	
		255		182		254		201		258		222		312		24
28.6	41.231		65.87		45.970		23.19		57.868		67.84		32.451		29.14	—
		222		163		223		185		226		211		275		18
Aug. 7.6	41.453		67.50		46.193		25.04		58.094		69.95		32.726		29.32	
		188		143		186		168		189		199		231		57
17.6	41.641		68.93		46.379		26.72		58.283		71.94		32.957		29.89	
		148		119		149		149		149		183		182		93
27.5	41.789		70.12		46.528		28.21		58.432		73.77		33.139		30.82	
		106		96		106		126		108		162		131		126
Sept. 6.5	41.895		71.08		46.634		29.47		58.540		75.39		33.270		32.08	
		67		71		66		102		68		141		77		152
16.5	41.962		71.79		46.700		30.49		58.608		76.80		33.347		33.60	
		28		49		31		78		30		117		27		171
26.5	41.990	—	72.28		46.731	—	31.27		58.638	—	77.97		33.374	—	35.31	
		6		26		8		58		5		94		21		182
Oct. 6.4	41.984		72.54		46.723		31.85		58.633		78.91		33.353		37.13	
		36		6		34		34		35		69		65		186
16.4	41.948		72.60	—	46.689		32.19		58.598		79.60		33.288		38.99	
		62		12		59		13		61		47		101		180
26.4	41.886		72.48		46.630		32.32	—	58.537		80.07		33.187		40.79	
		81		28		79		4		80		23		131		166
Nov. 5.3	41.805		72.20		46.551		32.28		58.457		80.30		33.056		42.45	
		94		40		96		24		96		2		152		146
15.3	41.711		71.80		46.455		32.04		58.361		80.32	—	32.904		43.91	
		104		50		104		37		105		20		165		118
25.3	41.607		71.30		46.351		31.67		58.256		80.12		32.739		45.09	
		107		59		109		51		110		39		172		86
Dec. 5.3	41.500		70.71		46.242		31.16		58.146		79.73		32.567		45.95	
		108		65		108		64		112		56		170		52
15.2	41.392		70.06		46.134		30.52		58.034		79.17		32.397		46.47	
		103		69		105		70		109		74		162		13
25.2	41.289		69.37		46.029		29.82		57.925		78.43		32.235		46.60	—
		95		70		96		76		102		87		150		26
35.2	41.194		68.67		45.933		29.06		57.823		77.56		32.085		46.34	
Mean Place	37.584		44.38		42.376		2.99		54.306		49.25		28.231		59.26	
Sec δ, Tan δ	1.000		+0.014		1.005		+0.104		1.024		+0.218		1.274		−0.789	
$D_\psi a$, $D_\omega a$	+0.06		0.00		+0.06		−0.01		+0.06		−0.01		+0.06		+0.05	
$D_\psi \delta$, $D_\omega \delta$	+0.4		−0.2		+0.4		−0.2		+0.4		−0.2		+0.4		−0.1	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	**72 Pegasi** (*mean*). Mag. 5.2				**λ Andromedæ.** Mag. 4.0				**ι Andromedæ.** Mag. 4.3				**ι Piscium.** Mag. 4.3			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 23 29		° ′ +30 51		h m 23 33		° ′ +46 0		h m 23 34		° ′ +42 48		h m 23 35		° ′ + 5 10	
	s		″		s		″		s		″		s		″	
Jan. 1.2	47.082		55.39		26.777		28.53		0.686		27.68		38.170		20.40	
		126		116		188		118		172		117		92		77
11.2	46.956		54.23		26.589		27.35		0.514		26.51		38.078		19.63	
		112		141		170		158		156		154		80		78
21.1	46.844		52.82		26.419		25.77		0.358		24.97		37.998		18.85	
		94		162		147		191		134		185		65		76
31.1	46.750		51.20		26.272		23.86		0.224		23.12		37.933		18.09	
		69		176		114		217		104		209		46		68
Feb. 10.1	46.681		49.44		26.158		21.69		0.120		21.03		37.887		17.41	
		38		181		74		233		66		222		21		59
20.1	46.643		47.63		26.084		19.36		0.054		18.81		37.866	—	16.82	
		4		179		28		239		24		228		5		44
Mar. 1.0	46.639	—	45.84		26.056	—	16.97		0.030	—	16.53		37.871		16.38	
		36		167		24		235		26		222		38		24
11.0	46.675		44.17		26.080		14.62		0.056		14.31		37.909		16.14	
		83		148		80		220		77		206		74		2
21.0	46.758		42.69		26.160		12.42		0.133		12.25		37.983		16.12	—
		126		121		137		197		132		182		111		24
31.0	46.884		41.48		26.297		10.45		0.265		10.43		38.094		16.36	
		171		88		194		163		187		148		149		51
Apr. 9.9	47.055		40.60		26.491		8.82		0.452		8.95		38.243		16.87	
		215		51		248		124		238		109		187		80
19.9	47.270		40.09		26.739		7.58		0.690		7.86		38.430		17.67	
		256		9		298		79		285		65		224		109
29.9	47.526		40.00	—	27.037		6.79		0.975		7.21		38.654		18.76	
		292		33		340		31		325		17		256		135
May 9.8	47.818		40.33		27.377		6.48	—	1.300		7.04	—	38.910		20.11	
		318		76		373		19		359		31		282		159
19.8	48.136		41.09		27.750		6.67		1.659		7.35		39.192		21.70	
		340		117		399		69		382		79		304		179
29.8	48.476		42.26		28.149		7.36		2.041		8.14		39.496		23.49	
		354		156		411		118		395		126		316		195
June 8.8	48.830		43.82		28.560		8.54		2.436		9.40		39.812		25.44	
		355		188		414		162		398		169		323		206
18.7	49.185		45.70		28.974		10.16		2.834		11.09		40.135		27.50	
		348		218		405		203		390		207		319		212
28.7	49.533		47.88		29.379		12.19		3.224		13.16		40.454		29.62	
		334		241		388		237		374		239		307		210
July 8.7	49.867		50.29		29.767		14.56		3.598		15.55		40.761		31.72	
		310		259		359		268		346		267		291		206
18.7	50.177		52.88		30.126		17.24		3.944		18.22		41.052		33.78	
		281		270		323		290		315		287		264		197
28.6	50.458		55.58		30.449		20.14		4.259		21.09		41.316		35.75	
		244		275		283		307		270		303		234		181
Aug. 7.6	50.702		58.33		30.732		23.21		4.529		24.12		41.550		37.56	
		204		274		234		316		227		309		197		163
17.6	50.906		61.07		30.966		26.37		4.756		27.21		41.747		39.19	
		161		268		184		319		179		310		159		144
27.5	51.067		63.75		31.150		29.56		4.935		30.31		41.906		40.63	
		117		255		132		316		130		305		119		120
Sept. 6.5	51.184		66.30		31.282		32.72		5.065		33.36		42.025		41.83	
		73		241		81		306		80		295		80		98
16.5	51.257		68.71		31.363		35.78		5.145		36.31		42.105		42.81	
		32		220		31		291		33		279		43		73
26.5	51.289	—	70.91		31.394	—	38.69		5.178	—	39.10		42.148		43.54	
		5		198		15		270		11		256		7		51
Oct. 6.4	51.284		72.89		31.379		41.39		5.167		41.66		42.155	—	44.05	
		41		170		58		243		50		231		24		28
16.4	51.243		74.59		31.321		43.82		5.117		43.97		42.131		44.33	
		71		142		95		213		87		200		49		10
26.4	51.172		76.01		31.226		45.95		5.030		45.97		42.082		44.43	—
		94		109		128		176		117		165		71		9
Nov. 5.4	51.078		77.10		31.098		47.71		4.913		47.62		42.011		44.34	
		115		76		153		137		141		126		86		27
15.3	50.963		77.86		30.945		49.08		4.772		48.88		41.925		44.07	
		127		40		176		95		162		84		97		40
25.3	50.836		78.26		30.769		50.03		4.610		49.72		41.828		43.67	
		137		5		191		48		174		41		104		52
Dec. 5.3	50.699		78.31	—	30.578		50.51		4.436		50.13	—	41.724		43.15	
		141		30		198		1		182		4		106		62
15.2	50.558		78.01		30.380		50.52	—	4.254		50.09		41.618		42.53	
		140		65		200		47		184		50		104		72
25.2	50.418		77.36		30.180		50.05		4.070		49.59		41.514		41.81	
		136		98		197		93		180		92		100		76
35.2	50.282		76.38		29.983		49.12		3.890		48.67		41.414		41.05	
Mean Place	46.957		42.00		26.900		10.72		0.732		10.65		37.741		15.28	
Sec δ, Tan δ	1.165		+0.598		1.440		+1.036		1.363		+0.926		1.004		+0.091	
$D_\psi \alpha$, $D_\omega \alpha$	+0.06		−0.04		+0.06		−0.07		+0.06		−0.06		+0.06		−0.01	
$D_\psi \delta$, $D_\omega \delta$	+0.4		−0.1		+0.4		−0.1		+0.4		−0.1		+0.4		−0.1	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Cephei. Mag. 3.4				κ Andromedæ. Mag. 4.3				ω² Aquarii. Mag. 4.6				ι¹ Aquarii. Mag. 5.3			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 23 35		° ′ +77 9		h m 23 36		° ′ +43 52		h m 23 38		° ′ −15 0		h m 23 39		° ′ −18 44	
	s		″		s		″		s		″		s		″	
Jan. 1.2	50.89	85	72.40	81	15.939	179	24.63	114	22.604	97	35.31	27	51.383	101	38.72	17
11.2	50.04	78	71.59	140	15.760	163	23.49	154	22.507	84	35.58	9	51.282	90	38.89	4
21.2	49.26	69	70.19	194	15.597	140	21.95	184	22.423	68	35.67	11	51.192	74	38.85	28
31.1	48.57	58	68.25	239	15.457	109	20.11	210	22.355	49	35.56	34	51.118	51	38.57	52
Feb. 10.1	47.99	43	65.86	273	15.348	71	18.01	225	22.306	23	35.22	54	51.067	26	38.05	76
20.1	47.56	26	63.13	296	15.277	29	15.76	231	22.283	3	34.68	78	51.041	2	37.29	100
Mar. 1.0	47.30	9	60.17	309	15.248	22	13.45	226	22.286	36	33.90	99	51.043	32	36.29	124
11.0	47.21	11	57.08	304	15.270	74	11.19	210	22.322	70	32.91	124	51.075	70	35.05	144
21.0	47.32	28	54.04	291	15.344	132	9.09	187	22.392	107	31.67	145	51.145	106	33.61	168
31.0	47.60	46	51.13	264	15.476	186	7.22	154	22.499	146	30.22	166	51.251	146	31.93	186
Apr. 9.9	48.06	63	48.49	228	15.662	239	5.68	117	22.645	184	28.56	183	51.397	185	30.07	203
19.9	48.69	77	46.21	184	15.901	287	4.51	70	22.829	220	26.73	199	51.582	222	28.04	214
29.9	49.46	88	44.37	133	16.188	328	3.81	23	23.049	254	24.74	211	51.804	252	25.90	224
May 9.8	50.34	97	43.04	78	16.516	362	3.58	25	23.303	282	22.63	217	52.056	285	23.66	227
19.8	51.31	103	42.26	20	16.878	387	3.83	74	23.585	305	20.46	220	52.341	308	21.39	224
29.8	52.34	106	42.06	39	17.265	400	4.57	121	23.890	320	18.26	215	52.649	322	19.15	218
June 8.8	53.40	106	42.45	97	17.665	403	5.78	165	24.210	327	16.11	206	52.971	330	16.97	204
18.7	54.46	103	43.42	150	18.068	398	7.43	204	24.537	326	14.05	193	53.301	330	14.93	187
28.7	55.49	98	44.92	201	18.466	378	9.47	237	24.863	317	12.12	172	53.631	321	13.06	166
July 8.7	56.47	90	46.93	248	18.844	353	11.84	265	25.180	298	10.40	151	53.952	303	11.40	138
18.7	57.37	79	49.41	286	19.197	318	14.49	288	25.478	275	8.89	123	54.255	279	10.02	112
28.6	58.16	68	52.27	321	19.515	279	17.37	302	25.753	243	7.66	96	54.534	247	8.90	77
Aug. 7.6	58.84	55	55.48	349	19.794	231	20.39	310	25.996	206	6.70	64	54.781	210	8.13	46
17.6	59.39	42	58.97	366	20.025	184	23.49	313	26.202	167	6.06	33	54.991	172	7.67	13
27.5	59.81	27	62.63	379	20.209	133	26.62	310	26.369	126	5.73	5	55.163	129	7.54	16
Sept. 6.5	60.08	12	66.42	384	20.342	86	29.72	299	26.495	83	5.68	23	55.292	86	7.70	45
16.5	60.20	2	70.26	380	20.428	35	32.71	282	26.578	44	5.91	46	55.378	43	8.15	68
26.5	60.18	16	74.06	369	20.463	9	35.53	264	26.622	5	6.37	67	55.421	7	8.83	87
Oct. 6.4	60.02	30	77.75	349	20.454	50	38.17	236	26.627	28	7.04	82	55.428	30	9.70	101
16.4	59.72	44	81.24	323	20.404	86	40.53	204	26.599	55	7.86	91	55.398	57	10.71	108
26.4	59.28	55	84.47	287	20.318	116	42.57	171	26.544	79	8.77	96	55.341	81	11.79	111
Nov. 5.4	58.73	65	87.34	245	20.202	144	44.28	133	26.465	96	9.73	96	55.260	99	12.90	109
15.3	58.08	74	89.79	196	20.058	163	45.61	90	26.369	107	10.69	92	55.161	113	13.99	100
25.3	57.34	83	91.75	140	19.895	178	46.51	47	26.262	113	11.61	83	55.048	119	14.99	88
Dec. 5.3	56.51	85	93.15	81	19.717	185	46.98	2	26.149	115	12.44	70	54.929	120	15.87	70
15.2	55.66	88	93.96	19	19.532	189	46.96	45	26.034	113	13.14	57	54.809	117	16.57	52
25.2	54.78	87	94.15	44	19.343	185	46.51	89	25.921	106	13.71	41	54.692	111	17.09	33
35.2	53.91		93.71		19.158		45.62		25.815		14.12		54.581		17.42	
Mean Place	53.418		48.73		15.986		7.22		22.031		33.66		50.782		35.88	
Sec δ, Tan δ	4.503		+4.391		1.387		+0.961		1.035		−0.268		1.056		−0.339	
Dψ α, Dω α	*+0.05*		−0.29		+0.06		−0.06		+0.06		+0.02		+0.06		+0.02	
Dψ δ, Dω δ	*+0.4*		*−0.1*		+0.4		−0.1		+0.4		−0.1		+0.4		−0.1	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	**ψ Andromedæ.** Mag. 5.1				**41 H. Cephei.** Mag. 5.0				**δ Sculptoris.** Mag. 4.6				**φ Pegasi.** Mag. 5.2			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	23 41		+45 57		23 43		+67 20		23 44		−28 35		23 48		+18 39	
	s		″		s		″		s		″		s		″	
Jan. 1.2	51.962	191	31.79	107	52.22	44	46.68	87	33.794	119	48.51	7	13.127	108	23.53	92
11.2	51.771	176	30.72	150	51.78	42	45.81	144	33.675	105	48.44	40	13.019	100	22.61	107
21.2	51.595	154	29.22	182	51.36	37	44.37	192	33.570	88	48.04	71	12.919	85	21.54	119
31.1	51.441	124	27.40	211	50.99	30	42.45	233	33.482	64	47.33	100	12.834	66	20.35	123
Feb. 10.1	51.317	84	25.29	228	50.69	23	40.12	265	33.418	40	46.33	120	12.768	43	19.12	123
20.1	51.233	40	23.01	236	50.46	13	37.47	284	33.378	8	45.04	155	12.725	12	17.89	114
Mar. 1.0	51.193	— 13	20.65	232	50.33	4	34.63	294	33.370	— 26	43.49	179	12.713	— 22	16.75	102
11.0	51.206	69	18.33	221	50.29	— 6	31.69	289	33.396	63	41.70	202	12.735	60	15.73	81
21.0	51.275	125	16.12	195	50.35	18	28.80	273	33.459	104	39.68	220	12.795	101	14.92	57
31.0	51.400	183	14.17	167	50.53	27	26.07	246	33.563	144	37.48	235	12.896	142	14.35	26
Apr. 9.9	51.583	239	12.50	128	50.80	38	23.61	209	33.707	185	35.13	246	13.038	184	14.09	— 5
19.9	51.822	290	11.22	84	51.18	46	21.52	165	33.892	226	32.67	253	13.222	223	14.14	41
29.9	52.112	332	10.38	37	51.64	54	19.87	115	34.118	262	30.14	253	13.445	259	14.55	76
May 9.9	52.444	369	10.01	— 13	52.18	59	18.72	60	34.380	293	27.61	249	13.704	287	15.31	110
19.8	52.813	395	10.14	63	52.77	64	18.12	4	34.673	318	25.12	239	13.991	312	16.41	140
29.8	53.208	412	10.77	111	53.41	66	18.08	— 52	34.991	337	22.73	223	14.303	326	17.81	170
June 8.8	53.620	416	11.88	155	54.07	65	18.60	108	35.328	346	20.50	201	14.629	333	19.51	192
18.7	54.036	408	13.43	196	54.72	65	19.68	160	35.674	348	18.49	174	14.962	331	21.43	212
28.7	54.444	391	15.39	233	55.37	62	21.28	207	36.022	340	16.75	144	15.293	321	23.55	224
July 8.7	54.835	368	17.72	261	55.99	58	23.35	251	36.362	323	15.31	109	15.614	303	25.79	233
18.7	55.203	331	20.33	285	56.57	52	25.86	287	36.685	297	14.22	73	15.917	279	28.12	234
28.6	55.534	292	23.18	302	57.09	45	28.73	319	36.982	265	13.49	35	16.196	246	30.46	231
Aug. 7.6	55.826	244	26.20	314	57.54	37	31.92	341	37.247	227	13.14	— 2	16.442	212	32.77	224
17.6	56.070	195	29.34	317	57.91	29	35.33	359	37.474	184	13.16	39	16.654	173	35.01	210
27.6	56.265	145	32.51	315	58.20	21	38.92	366	37.658	140	13.55	72	16.827	133	37.11	195
Sept. 6.5	56.410	94	35.66	306	58.41	13	42.58	369	37.798	93	14.27	99	16.960	94	39.06	176
16.5	56.504	44	38.72	294	58.54	4	46.27	363	37.891	47	15.26	125	17.054	54	40.82	154
26.5	56.548	— 3	41.66	272	58.58	— 5	49.90	349	37.938	5	16.51	140	17.108	18	42.36	132
Oct. 6.4	56.545	45	44.38	249	58.53	13	53.39	329	37.943	— 34	17.91	151	17.126	— 13	43.68	107
16.4	56.500	85	46.87	217	58.40	20	56.68	300	37.909	67	19.42	153	17.113	41	44.75	83
26.4	56.415	117	49.04	182	58.20	27	59.68	266	37.842	93	20.95	149	17.072	65	45.58	57
Nov. 5.4	56.298	146	50.86	145	57.93	32	62.34	224	37.749	115	22.44	138	17.007	84	46.15	32
15.3	56.152	168	52.31	103	57.61	37	64.58	175	37.634	128	23.82	121	16.923	98	46.47	8
25.3	55.984	184	53.34	57	57.24	41	66.33	123	37.506	135	25.03	99	16.825	108	46.55	— 18
Dec. 5.3	55.800	196	53.91	10	56.83	44	67.56	66	37.371	141	26.02	72	16.717	114	46.37	41
15.3	55.604	200	54.01	— 37	56.39	45	68.22	7	37.230	136	26.74	44	16.603	116	45.96	64
25.2	55.404	197	53.64	83	55.94	45	68.29	— 54	37.094	130	27.18	13	16.487	114	45.32	83
35.2	55.207		52.81		55.49		67.75		36.964		27.31		16.373		44.49	
Mean Place	52.003		13.62		53.121		23.90		33.113		42.75		12.732		13.42	
Sec δ, Tan δ	1.438		+1.034		2.596		+2.395		1.139		−0.545		1.056		+0.338	
$D_\psi \alpha$, $D_\omega \alpha$	+0.06		−0.07		+0.06		−0.16		+0.06		+0.04		+0.06		−0.02	
$D_\psi \delta$, $D_\omega \delta$	+0.4		−0.1		+0.4		−0.1		+0.4		−0.1		+0.4		−0.1	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ρ Cassiopeiæ. Mag. 4.8				Groombridge 4163. Mag. 6.6				ω Piscium. Mag. 4.0			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′	
	23 50		+57 1		23 50		+73 56		23 54		+ 6 23	
	s		″		s		″		s		″	
Jan. 1.2	10.468		76.56		42.12		58.17		60.353		60.06	
11.2	10.189	279	75.64	92	41.45	67	57.50	67	60.254	99	59.31	75
21.2	9.928	261	74.23	141	40.83	62	56.24	126	60.163	91	58.54	77
31.1	9.694	234	72.38	185	40.26	57	54.43	181	60.085	78	57.78	76
Feb. 10.1	9.500	194	70.18	220	39.79	47	52.18	225	60.024	61	57.08	70
20.1	9.357	143	67.72	246	39.42	37	49.53	265	59.984	40	56.47	61
Mar. 1.0	9.272	85	65.09	263	39.18	24	46.67	286	59.971	13	55.99	48
11.0	9.254	18	62.42	267	39.08	10	43.66	301	59.989	18	55.69	30
21.0	9.310	56	59.82	260	39.12	4	40.66	300	60.042	53	55.60	9
31.0	9.440	130	57.39	243	39.32	20	37.77	289	60.133	91	55.77	17
Apr. 9.9	9.643	203	55.25	214	39.66	34	35.10	267	60.264	131	56.20	43
19.9	9.919	276	53.47	178	40.14	48	32.78	232	60.434	170	56.92	72
29.9	10.259	340	52.12	135	40.73	59	30.87	191	60.643	209	57.91	99
May 9.9	10.655	396	51.26	86	41.44	71	29.46	141	60.886	243	59.19	128
19.8	11.096	441	50.91	35	42.22	78	28.60	86	61.159	273	60.70	151
29.8	11.570	474	51.10	19	43.06	84	28.29	31	61.456	297	62.44	174
June 8.8	12.065	495	51.82	72	43.93	87	28.55	26	61.769	313	64.34	190
18.7	12.566	501	53.05	123	44.81	88	29.36	81	62.090	321	66.36	202
28.7	13.061	495	54.76	171	45.67	86	30.75	139	62.412	322	68.47	211
July 8.7	13.537	476	56.91	215	46.50	83	32.63	188	62.726	314	70.59	212
18.7	13.982	445	59.43	252	47.28	78	34.97	234	63.023	297	72.66	207
28.6	14.387	405	62.26	283	47.98	70	37.72	275	63.299	276	74.66	200
Aug. 7.6	14.744	357	65.36	310	48.59	61	40.83	311	63.546	247	76.53	187
17.6	15.046	302	68.64	328	49.10	51	44.21	338	63.759	213	78.22	169
27.6	15.289	243	72.04	340	49.50	40	47.81	360	63.935	176	79.72	150
Sept. 6.5	15.469	180	75.49	345	49.79	29	51.52	371	64.074	139	81.01	129
16.5	15.587	118	78.92	343	49.96	17	55.30	378	64.173	99	82.06	105
26.5	15.644	57	82.26	334	50.02	6	59.06	376	64.234	61	82.88	82
Oct. 6.4	15.640	4	85.45	319	49.96	6	62.72	366	64.260	26	83.46	58
16.4	15.582	58	88.41	296	49.79	17	66.20	348	64.256	4	83.83	37
26.4	15.472	110	91.09	268	49.51	28	69.45	325	64.223	33	83.98	15
Nov. 5.4	15.316	156	93.43	234	49.13	38	72.35	290	64.168	55	83.96	2
15.3	15.120	196	95.37	194	48.66	47	74.87	252	64.093	75	83.76	20
25.3	14.891	229	96.85	148	48.12	54	76.89	202	64.005	88	83.41	35
Dec. 5.3	14.634	257	97.84	99	47.52	60	78.38	149	63.908	97	82.94	47
15.3	14.360	274	98.30	46	46.87	65	79.29	91	63.805	103	82.36	58
25.2	14.076	284	98.23	7	46.20	67	79.62	33	63.699	106	81.68	68
35.2	13.790	286	97.61	62	45.52	68	79.31	31	63.595	104	80.94	74
Mean Place	10.729		55.46		43.583		34.20		59.818		53.99	
Sec δ, Tan δ	1.838		+1.542		3.617		+3.475		1.006		+0.112	
$D_\psi \alpha$, $D_\omega \alpha$	+0.06		−0.10		+0.06		−0.23		+0.06		−0.01	
$D_\psi \delta$, $D_\omega \delta$	+0.4		0.0		+0.4		0.0		+0.4		0.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ε Tucanæ. Mag. 4.7				30 Piscium. Mag. 4.7				2 Ceti. Mag. 4.6			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 23 55		° ′ −66 2		h m 23 57		° ′ − 6 28		h m 23 59		° ′ −17 47	
	s		″		s		″		s		″	
Jan. 1.2	34.65		52.71		39.768		49.59		26.971		75.41	
11.2	34.25	40	51.59	112	39.669	99	50.11	52	26.863	108	75.68	27
21.2	33.88	37	49.94	165	39.579	90	50.51	40	26.764	99	75.73	5
31.1	33.56	32	47.79	215	39.499	80	50.77	26	26.678	86	75.54	19
Feb. 10.1	33.30	26	45.21	258	39.439	60	50.89	12	26.611	67	75.12	42
20.1	33.11	19	42.27	294	39.398	41	50.82	7	26.565	46	74.44	68
Mar. 1.1	32.98	13	39.02	325	39.384	14	50.56	26	26.547	18	73.53	91
11.0	32.94	4	35.55	347	39.399	15	50.09	47	26.559	12	72.37	116
21.0	32.97	3	31.96	359	39.449	50	49.39	70	26.605	46	70.97	140
31.0	33.08	11	28.29	367	39.535	86	48.44	95	26.690	85	69.35	162
Apr. 9.9	33.27	19	24.63	366	39.661	126	47.25	119	26.814	124	67.55	180
19.9	33.55	28	21.07	356	39.825	164	45.83	142	26.978	164	65.55	200
29.9	33.90	35	17.66	341	40.028	203	44.20	163	27.181	203	63.41	214
May 9.9	34.33	43	14.50	316	40.265	237	42.39	181	27.419	238	61.17	224
19.8	34.82	49	11.63	287	40.532	267	40.44	195	27.690	271	58.88	229
29.8	35.37	55	9.13	250	40.825	293	38.38	206	27.987	297	56.58	230
June 8.8	35.95	58	7.06	207	41.134	309	36.27	211	28.302	315	54.34	224
18.8	36.55	60	5.46	160	41.454	320	34.15	212	28.628	326	52.22	212
28.7	37.17	62	4.37	109	41.774	320	32.11	204	28.956	328	50.25	197
July 8.7	37.78	61	3.81	56	42.090	316	30.15	196	29.280	324	48.49	176
18.7	38.36	58	3.80	1	42.390	300	28.36	179	29.589	309	46.99	150
28.6	38.91	55	4.34	54	42.668	278	26.77	159	29.878	289	45.78	121
Aug. 7.6	39.41	50	5.40	106	42.917	249	25.41	136	30.136	258	44.88	90
17.6	39.82	41	6.94	154	43.134	217	24.29	112	30.362	226	44.31	57
27.6	40.16	34	8.91	197	43.314	180	23.46	83	30.550	188	44.08	23
Sept. 6.5	40.41	25	11.24	233	43.455	141	22.91	55	30.697	147	44.15	7
16.5	40.57	16	13.84	260	43.557	102	22.61	30	30.801	104	44.53	38
26.5	40.62	5	16.61	277	43.621	64	22.58	3	30.866	65	45.17	64
Oct. 6.5	40.57	5	19.44	283	43.648	27	22.78	20	30.891	25	46.02	85
16.4	40.43	14	22.22	278	43.642	6	23.16	38	30.882	9	47.03	101
26.4	40.21	22	24.82	260	43.608	34	23.69	53	30.842	40	48.13	110
Nov. 5.4	39.91	30	27.15	233	43.550	58	24.34	65	30.776	66	49.29	116
15.3	39.55	36	29.12	197	43.473	77	25.07	73	30.690	86	50.42	113
25.3	39.15	40	30.62	150	43.385	88	25.82	75	30.589	101	51.50	108
Dec. 5.3	38.72	43	31.60	98	43.285	100	26.59	77	30.478	111	52.47	97
15.3	38.28	44	32.01	41	43.180	105	27.32	73	30.360	118	53.28	81
25.2	37.84	44	31.84	17	43.073	107	28.00	68	30.243	117	53.91	63
35.2	37.42	42	31.09	75	42.968	105	28.59	59	30.128	115	54.35	44
Mean Place	33.604		39.06		39.136		51.21		26.264		73.25	
Sec δ, Tan δ	2.463		−2.250		1.006		−0.114		1.050		−0.321	
$D_\psi \alpha$, $D_\omega \alpha$	+0.06		+0.15		+0.06		+0.01		+0.06		+0.02	
$D_\psi \delta$, $D_\omega \delta$	+0.4		0.0		+0.4		0.0		+0.4		0.0	

FOR WASHINGTON APPARENT NOON.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Equation of Time. Mean—App.	Var. per Hour.	Semi-diameter.	S. T. of Sem. Pass. Merid.	Sidereal Time of Mean Noon.
	h m s	s	° ′ ″	″	m s	s	′ ″	m s	h m s
Jan 1	18 43 24.52	11.056	−23 4 36.1	+11.47	+ 3 17.16	+1.196	16 17.84	1 11.08	18 40 6.83
2	18 47 49.72	11.043	22 59 47.1	12.62	3 45.71	1.183	16 17.84	1 11.04	18 44 3.39
3	18 52 14.59	11.029	22 54 30.5	13.76	4 13.94	1.169	16 17.84	1 10.99	18 47 59.95
4	18 56 39.11	11.014	22 48 46.5	14.90	4 41.83	1.154	16 17.84	1 10.94	18 51 56.50
5	19 1 3.24	10.997	22 42 35.2	16.04	5 9.34	1.138	16 17.83	1 10.88	18 55 53.06
6	19 5 26.95	10.979	−22 35 56.8	+17.16	+ 5 36.42	+1.119	16 17.82	1 10.82	18 59 49.62
7	19 9 50.21	10.959	22 28 51.6	18.27	6 3.04	1.099	16 17.80	1 10.76	19 3 46.18
8	19 14 12.98	10.938	22 21 19.8	19.38	6 29.17	1.078	16 17.78	1 10.70	19 7 42.74
9	19 18 35.22	10.916	22 13 21.6	20.47	6 54.79	1.056	16 17.75	1 10.63	19 11 39.30
10	19 22 56.92	10.892	22 4 57.3	21.55	7 19.86	1.032	16 17.72	1 10.55	19 15 35.85
11	19 27 18.04	10.868	−21 56 7.1	+22.62	+ 7 44.35	+1.008	16 17.69	1 10.48	19 19 32.41
12	19 31 38.56	10.842	21 46 51.4	23.69	8 8.25	0.983	16 17.65	1 10.40	19 23 28.97
13	19 35 58.46	10.816	21 37 10.3	24.74	8 31.53	0.957	16 17.61	1 10.32	19 27 25.53
14	19 40 17.73	10.789	21 27 4.2	25.77	8 54.18	0.928	16 17.56	1 10.24	19 31 22.09
15	19 44 36.34	10.761	21 16 33.3	26.80	9 16.17	0.901	16 17.51	1 10.15	19 35 18.65
16	19 48 54.27	10.733	−21 5 38.0	+27.81	+ 9 37.48	+0.874	16 17.45	1 10.06	19 39 15.20
17	19 53 11.51	10.704	20 54 18.6	28.81	9 58.11	0.845	16 17.38	1 9.97	19 43 11.76
18	19 57 28.04	10.674	20 42 35.3	29.80	10 18.03	0.815	16 17.30	1 9.87	19 47 8.32
19	20 1 43.85	10.644	20 30 28.4	30.77	10 37.23	0.784	16 17.22	1 9.77	19 51 4.88
20	20 5 58.93	10.613	20 17 58.4	31.73	10 55.71	0.753	16 17.14	1 9.66	19 55 1.43
21	20 10 13.27	10.582	−20 5 5.5	+32.68	+11 13.44	+0.722	16 17.05	1 9.56	19 58 57.99
22	20 14 26.86	10.550	19 51 50.0	33.61	11 30.43	0.691	16 16.95	1 9.46	20 2 54.55
23	20 18 39.69	10.519	19 38 12.3	34.53	11 46.65	0.660	16 16.85	1 9.35	20 6 51.11
24	20 22 51.75	10.486	19 24 12.7	35.44	12 2.11	0.628	16 16.74	1 9.24	20 10 47.66
25	20 27 3.04	10.454	19 9 51.5	36.33	12 16.80	0.595	16 16.62	1 9.13	20 14 44.22
26	20 31 13.55	10.422	−18 55 9.2	+37.20	+12 30.72	+0.564	16 16.50	1 9.02	20 18 40.78
27	20 35 23.28	10.389	18 40 6.1	38.06	12 43.85	0.531	16 16.38	1 8.91	20 22 37.33
28	20 39 32.22	10.356	18 24 42.6	38.90	12 56.20	0.497	16 16.25	1 8.80	20 26 33.89
29	20 43 40.36	10.323	18 8 59.0	39.73	13 7.75	0.464	16 16.12	1 8.68	20 30 30.45
30	20 47 47.70	10.289	17 52 55.7	40.54	13 18.51	0.431	16 15.99	1 8.56	20 34 27.00
31	20 51 54.24	10.256	−17 36 33.2	+41.33	+13 28.47	+0.398	16 15.85	1 8.45	20 38 23.56
Feb. 1	20 55 59.97	10.222	17 19 51.8	42.11	13 37.62	0.364	16 15.71	1 8.33	20 42 20.12
2	21 0 4.89	10.188	17 2 52.1	42.87	13 45.95	0.331	16 15.56	1 8.21	20 46 16.67
3	21 4 8.99	10.154	16 45 34.3	43.61	13 53.48	0.297	16 15.41	1 8.10	20 50 13.23
4	21 8 12.26	10.119	16 27 58.9	44.33	14 0.19	0.262	16 15.25	1 7.99	20 54 9.79
5	21 12 14.71	10.085	−16 10 6.5	+45.03	+14 6.05	+0.228	16 15.10	1 7.88	20 58 6.34
6	21 16 16.33	10.050	15 51 57.5	45.72	14 11.11	0.193	16 14.94	1 7.77	21 2 2.90
7	21 20 17.13	10.016	15 33 32.2	46.39	14 15.35	0.159	16 14.78	1 7.65	21 5 59.46
8	21 24 17.11	9.982	15 14 51.0	47.04	14 18.75	0.125	16 14.61	1 7.54	21 9 56.01
9	21 28 16.27	9.948	14 55 54.5	47.67	14 21.34	0.091	16 14.44	1 7.42	21 13 52.57
10	21 32 14.62	9.914	−14 36 43.1	+48.28	+14 23.14	+0.058	16 14.27	1 7.31	21 17 49.12
11	21 36 12.16	9.881	14 17 17.1	48.88	14 24.13	+0.024	16 14.10	1 7.20	21 21 45.68
12	21 40 8.91	9.848	13 57 37.0	49.46	14 24.31	−0.008	16 13.92	1 7.09	21 25 42.23
13	21 44 4.88	9.816	13 37 43.2	50.02	14 23.73	0.041	16 13.74	1 6.98	21 29 38.79
14	21 48 0.07	9.784	13 17 36.2	50.57	14 22.36	0.073	16 13.55	1 6.87	21 33 35.34
15	21 51 54.50	9.752	−12 57 16.2	+51.09	+14 20.24	−0.104	16 13.36	1 6.76	21 37 31.90
16	*21 55 48.18*	9.721	−12 36 43.8	+51.60	+14 17.38	−0.135	16 13.17	1 6.66	21 41 28.45

Note.—For mean time interval of semidiameter passing meridian, subtract $0^{s}.19$ *from the sidereal interval.*

FOR WASHINGTON APPARENT NOON.

Date.		Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Equation of Time. Mean−App.	Var. per Hour.	Semi-diameter.	S. T. of Sem. Pass. Merid.	Sidereal Time of Mean Noon.
		h m s	s	° ′ ″	″	m s	s	′ ″	m s	h m s
Feb.	16	21 55 48.18	9.721	−12 36 43.8	+51.60	+14 17.38	−0.135	16 13.17	1 6.66	21 41 28.45
	17	21 59 41.12	9.691	12 15 59.3	52.10	14 13.78	0.165	16 12.97	1 6.56	21 45 25.01
	18	22 3 33.35	9.662	11 55 3.1	52.58	14 9.47	0.194	16 12.76	1 6.46	21 49 21.56
	19	22 7 24.88	9.633	11 33 55.6	53.04	14 4.46	0.223	16 12.55	1 6.36	21 53 18.12
	20	22 11 15.73	9.605	11 12 37.2	53.49	13 58.77	0.251	16 12.33	1 6.26	21 57 14.67
	21	22 15 5.91	9.577	−10 51 8.2	+53.92	+13 52.41	−0.279	16 12.11	1 6.16	22 1 11.23
	22	22 18 55.44	9.551	10 29 29.0	54.34	13 45.40	0.305	16 11.88	1 6.06	22 5 7.78
	23	22 22 44.34	9.525	10 7 40.2	54.73	13 37.77	0.331	16 11.66	1 5.97	22 9 4.34
	24	22 26 32.64	9.500	9 45 42.0	55.11	13 29.53	0.356	16 11.43	1 5.88	22 13 0.89
	25	22 30 20.34	9.475	9 23 34.8	55.48	13 20.70	0.380	16 11.20	1 5.79	22 16 57.45
	26	22 34 7.46	9.452	− 9 1 19.0	+55.83	+13 11.29	−0.404	16 10.96	1 5.71	22 20 54.00
	27	22 37 54.02	9.429	8 38 54.9	56.17	13 1.33	0.427	16 10.73	1 5.63	22 24 50.55
	28	22 41 40.04	9.406	8 16 23.1	56.48	12 50.82	0.449	16 10.49	1 5.55	22 28 47.11
	29	22 45 25.53	9.385	7 53 44.0	56.78	12 39.79	0.470	16 10.25	1 5.47	22 32 43.66
Mar.	1	22 49 10.51	9.364	7 30 57.9	57.06	12 28.25	0.491	16 10.00	1 5.40	22 36 40.21
	2	22 52 55.00	9.344	− 7 8 5.3	+57.32	+12 16.21	−0.512	16 9.76	1 5.33	22 40 36.77
	3	22 56 39.00	9.324	6 45 6.6	57.57	12 3.69	0.531	16 9.51	1 5.26	22 44 33.32
	4	23 0 22.54	9.305	6 22 2.3	57.79	11 50.72	0.550	16 9.26	1 5.19	22 48 29.88
	5	23 4 5.62	9.286	5 58 52.7	58.00	11 37.28	0.569	16 9.01	1 5.13	22 52 26.43
	6	23 7 48.26	9.268	5 35 38.3	58.20	11 23.40	0.587	16 8.76	1 5.07	22 56 22.98
	7	23 11 30.49	9.251	− 5 12 19.4	+58.37	+11 9.12	−0.604	16 8.51	1 5.01	23 0 19.54
	8	23 15 12.31	9.234	4 48 56.6	58.53	10 54.43	0.620	16 8.26	1 4.95	23 4 16.09
	9	23 18 53.74	9.219	4 25 30.2	58.67	10 39.35	0.636	16 8.01	1 4.90	23 8 12.64
	10	23 22 34.81	9.204	4 2 0.5	58.80	10 23.90	0.651	16 7.75	1 4.85	23 12 9.20
	11	23 26 15.53	9.190	3 38 28.0	58.91	10 8.11	0.665	16 7.49	1 4.80	23 16 5.75
	12	23 29 55.92	9.176	− 3 14 53.0	+59.00	+ 9 51.99	−0.678	16 7.23	1 4.75	23 20 2.31
	13	23 33 36.00	9.164	2 51 15.9	59.08	9 35.56	0.691	16 6.97	1 4.70	23 23 58.86
	14	23 37 15.79	9.152	2 27 37.0	59.15	9 18.84	0.702	16 6.71	1 4.66	23 27 55.41
	15	23 40 55.32	9.142	2 3 56.8	59.2[illegible]	9 1.87	0.712	16 6.45	1 4.62	23 31 51.97
	16	23 44 34.60	9.132	1 40 15.6	59.23	8 44.65	0.722	16 6.19	1 4.59	23 35 48.52
	17	23 48 13.66	9.123	− 1 16 33.7	+59.25	+ 8 27.21	−0.731	16 5.92	1 4.57	23 39 45.07
	18	23 51 52.53	9.116	0 52 51.5	59.26	8 9.57	0.739	16 5.65	1 4.55	23 43 41.63
	19	23 55 31.22	9.109	0 29 9.3	59.25	7 51.75	0.745	16 5.38	1 4.53	23 47 38.18
	20	23 59 9.76	9.103	− 0 5 27.4	59.23	7 33.79	0.751	16 5.11	1 4.51	23 51 34.73
	21	0 2 48.18	9.099	+ 0 18 13.8	59.20	7 15.71	0.756	16 4.83	1 4.49	23 55 31.29
	22	0 6 26.50	9.095	+ 0 41 54.0	+59.15	+ 6 57.52	−0.759	16 4.55	1 4.47	23 59 27.84
	23	0 10 4.74	9.092	1 5 32.9	59.09	6 39.26	0.762	16 4.27	1 4.46	0 3 24.39
	24	0 13 42.92	9.091	1 29 10.1	59.01	6 20.94	0.764	16 3.99	1 4.45	0 7 20.94
	25	0 17 21.08	9.090	1 52 45.2	58.92	6 2.59	0.765	16 3.71	1 4.44	0 11 17.50
	26	0 20 59.23	9.090	2 16 18.0	58.81	5 44.23	0.765	16 3.43	1 4.44	0 15 14.05
	27	0 24 37.38	9.091	+ 2 39 48.1	+58.69	+ 5 25.88	−0.764	16 3.14	1 4.44	0 19 10.60
	28	0 28 15.57	9.092	3 3 15.1	58.55	5 7.56	0.762	16 2.85	1 4.44	0 23 7.16
	29	0 31 53.81	9.095	3 26 38.6	58.40	4 49.30	0.759	16 2.57	1 4.45	0 27 3.71
	30	0 35 32.12	9.098	3 49 58.2	58.23	4 31.11	0.756	16 2.29	1 4.46	0 31 0.27
	31	0 39 10.51	9.102	4 13 13.7	58.05	4 13.00	0.752	16 2.01	1 4.47	0 34 56.82
Apr.	1	0 42 49.01	9.106	+ 4 36 24.6	+57.86	+ 3 55.00	−0.748	16 1.73	1 4.48	0 38 53.37
	2	0 46 27.62	9.111	+ 4 59 30.6	+57.64	+ 3 37.10	−0.743	16 1.46	1 4.50	0 42 49.93

NOTE.—For mean time interval of semidiameter passing meridian, subtract $0^{s}.18$ from the sidereal interval.

FOR WASHINGTON APPARENT NOON.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Equation of Time. Mean—App.	Var. per Hour.	Semi-diameter.	S. T. of Sem. Pass. Merid.	Sidereal Time of Mean Noon.
	h m s	s	° ′ ″	″	m s	s	′ ″	m s	h m s
Apr. 1	0 42 49.01	9.106	+ 4 36 24.6	+57.86	+3 55.00	−0.748	16 1.73	1 4.48	0 38 53.37
2	0 46 27.62	9.111	4 59 30.6	57.64	3 37.10	0.743	16 1.46	1 4.50	0 42 49.93
3	0 50 6.36	9.117	5 22 31.1	57.41	3 19.33	0.737	16 1.18	1 4.52	0 46 46.48
4	0 53 45.24	9.123	5 45 25.9	57.16	3 1.71	0.731	16 0.91	1 4.54	0 50 43.03
5	0 57 24.29	9.130	6 8 14.7	56.90	2 44.26	0.724	16 0.63	1 4.57	0 54 39.59
6	1 1 3.52	9.138	+ 6 30 57.1	+56.63	+2 26.98	−0.716	16 0.36	1 4.60	0 58 36.14
7	1 4 42.94	9.147	6 53 32.6	56.33	2 9.89	0.708	16 0.09	1 4.64	1 2 32.69
8	1 8 22.56	9.155	7 16 1.0	56.03	1 53.00	0.699	15 59.82	1 4.67	1 6 29.25
9	1 12 2.41	9.165	7 38 22.0	55.71	1 36.34	0.689	15 59.55	1 4.71	1 10 25.80
10	1 15 42.51	9.176	8 0 35.1	55.38	1 19.92	0.679	15 59.28	1 4.75	1 14 22.36
11	1 19 22.86	9.187	+ 8 22 40.0	+55.03	+1 3.77	−0.667	15 59.01	1 4.79	1 18 18.91
12	1 23 3.49	9.199	8 44 36.5	54.67	0 47.90	0.655	15 58.75	1 4.84	1 22 15.46
13	1 26 44.41	9.211	9 6 24.2	54.30	0 32.31	0.643	15 58.48	1 4.88	1 26 12.02
14	1 30 25.64	9.225	9 28 2.7	53.91	0 17.02	0.630	15 58.21	1 4.93	1 30 8.57
15	1 34 7.20	9.239	9 49 31.7	53.51	+0 2.07	0.616	15 57.95	1 4.98	1 34 5.13
16	1 37 49.10	9.253	+10 10 51.0	+53.10	−0 12.54	−0.601	15 57.69	1 5.04	1 38 1.68
17	1 41 31.36	9.269	10 32 0.2	52.67	0 26.79	0.586	15 57.42	1 5.09	1 41 58.23
18	1 45 14.01	9.285	10 52 59.0	52.23	0 40.66	0.569	15 57.16	1 5.15	1 45 54.79
19	1 48 57.06	9.302	11 13 47.2	51.78	0 54.13	0.552	15 56.89	1 5.21	1 49 51.34
20	1 52 40.53	9.320	11 34 24.4	51.32	1 7.18	0.535	15 56.63	1 5.27	1 53 47.90
21	1 56 24.43	9.339	+11 54 50.3	+50.84	−1 19.80	−0.516	15 56.36	1 5.33	1 57 44.45
22	2 0 8.79	9.358	12 15 4.5	50.35	1 31.96	0.497	15 56.10	1 5.40	2 1 41.01
23	2 3 53.62	9.378	12 35 6.8	49.84	1 43.65	0.477	15 55.84	1 5.46	2 5 37.56
24	2 7 38.93	9.398	12 54 56.8	49.32	1 54.86	0.457	15 55.58	1 5.53	2 9 34.12
25	2 11 24.74	9.419	13 14 34.2	48.79	2 5.58	0.436	15 55.32	1 5.60	2 13 30.67
26	2 15 11.05	9.440	+13 33 58.7	+48.25	−2 15.79	−0.415	15 55.07	1 5.67	2 17 27.23
27	2 18 57.88	9.462	13 53 9.9	47.69	2 25.49	0.393	15 54.82	1 5.74	2 21 23.78
28	2 22 45.23	9.484	14 12 7.5	47.11	2 34.67	0.371	15 54.57	1 5.81	2 25 20.34
29	2 26 33.12	9.506	14 30 51.1	46.52	2 43.32	0.349	15 54.32	1 5.89	2 29 16.89
30	2 30 21.54	9.528	14 49 20.4	45.92	2 51.44	0.327	15 54.07	1 5.97	2 33 13.45
May 1	2 34 10.49	9.551	+15 7 35.0	+45.30	−2 59.01	−0.304	15 53.83	1 6.04	2 37 10.00
2	2 37 59.99	9.574	15 25 34.7	44.67	3 6.05	0.282	15 53.60	1 6.12	2 41 6.56
3	2 41 50.04	9.597	15 43 19.0	44.02	3 12.55	0.259	15 53.36	1 6.20	2 45 3.11
4	2 45 40.64	9.620	16 0 47.6	43.36	3 18.50	0.236	15 53.13	1 6.28	2 48 59.67
5	2 49 31.78	9.642	16 18 0.2	42.69	3 23.90	0.213	15 52.90	1 6.36	2 52 56.22
6	2 53 23.47	9.665	+16 34 56.6	+42.01	−3 28.74	−0.190	15 52.68	1 6.44	2 56 52.78
7	2 57 15.72	9.689	16 51 36.5	41.31	3 33.03	0.167	15 52.47	1 6.52	3 0 49.34
8	3 1 8.53	9.712	17 7 59.4	40.60	3 36.77	0.144	15 52.26	1 6.61	3 4 45.89
9	3 5 1.89	9.735	17 24 5.1	39.87	3 39.96	0.121	15 52.05	1 6.70	3 8 42.45
10	3 8 55.81	9.758	17 39 53.3	39.14	3 42.59	0.098	15 51.84	1 6.78	3 12 39.01
11	3 12 50.28	9.781	+17 55 23.7	+38.39	−3 44.67	−0.075	15 51.63	1 6.86	3 16 35.56
12	3 16 45.31	9.805	18 10 36.1	37.64	3 46.19	0.052	15 51.43	1 6.94	3 20 32.12
13	3 20 40.90	9.828	18 25 30.2	36.87	3 47.15	0.028	15 51.22	1 7.02	3 24 28.67
14	3 24 37.05	9.851	18 40 5.6	36.08	3 47.55	−0.005	15 51.02	1 7.10	3 28 25.23
15	3 28 33.76	9.875	18 54 22.1	35.29	3 47.40	+0.018	15 50.82	1 7.18	3 32 21.79
16	3 32 31.03	9.898	+19 8 19.6	+34.49	−3 46.70	+0.041	15 50.62	1 7.26	3 36 18.34
17	*3 36* 28.85	9.921	+19 21 57.7	+33.68	−3 45.44	+0.064	15 50.43	1 7.35	3 40 14.90

***Note.**—For mean time interval of semidiameter passing meridian, subtract $0^{s}.18$ from the sidereal interval.*

FOR WASHINGTON APPARENT NOON.

Date.		Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Equation of Time. Mean−App.	Var. per Hour.	Semi-diameter.	S. T. of Sem. Pass. Merid.	Sidereal Time of Mean Noon.
		h m s	s	° ′ ″	″	m s	s	′ ″	m s	h m s
ay	17	3 36 28.85	9.921	+19 21 57.7	+33.68	−3 45.44	+0.064	15 50.43	1 7.35	3 40 14.90
	18	3 40 27.24	9.945	19 35 16.1	32.85	3 43.61	0.088	15 50.24	1 7.43	3 44 11.46
	19	3 44 26.19	9.968	19 48 14.5	32.01	3 41.22	0.111	15 50.05	1 7.51	3 48 8.02
	20	3 48 25.70	9.991	20 0 52.8	31.17	3 38.27	0.134	15 49.87	1 7.59	3 52 4.57
	21	3 52 25.76	10.014	20 13 10.8	30.32	3 34.77	0.157	15 49.68	1 7.66	3 56 1.13
	22	3 56 26.39	10.038	+20 25 8.2	+29.46	−3 30.72	+0.180	15 49.50	1 7.73	3 59 57.69
	23	4 0 27.57	10.060	20 36 44.6	28.58	3 26.12	0.203	15 49.32	1 7.80	4 3 54.24
	24	4 4 29.28	10.082	20 47 59.9	27.69	3 20.98	0.225	15 49.14	1 7.87	4 7 50.80
	25	4 8 31.52	10.104	20 58 53.8	26.80	3 15.31	0.247	15 48.97	1 7.94	4 11 47.36
	26	4 12 34.27	10.125	21 9 26.0	25.89	3 9.13	0.268	15 48.80	1 8.01	4 15 43.92
	27	4 16 37.53	10.146	+21 19 36.4	+24.98	−3 2.44	+0.289	15 48.64	1 8.08	4 19 40.47
	28	4 20 41.28	10.166	21 29 24.7	24.05	2 55.27	0.309	15 48.48	1 8.14	4 23 37.03
	29	4 24 45.50	10.186	21 38 50.7	23.11	2 47.63	0.328	15 48.32	1 8.21	4 27 33.59
	30	4 28 50.17	10.204	21 47 54.1	22.17	2 39.54	0.346	15 48.17	1 8.27	4 31 30.14
	31	4 32 55.28	10.222	21 56 34.8	21.22	2 31.02	0.364	15 48.03	1 8.33	4 35 26.70
une	1	4 37 0.81	10.239	+22 4 52.6	+20.26	−2 22.07	+0.381	15 47.89	1 8.39	4 39 23.26
	2	4 41 6.73	10.255	22 12 47.3	19.29	2 12.73	0.397	15 47.75	1 8.44	4 43 19.82
	3	4 45 13.02	10.270	22 20 18.7	18.32	2 3.01	0.412	15 47.62	1 8.49	4 47 16.38
	4	4 49 19.67	10.284	22 27 26.6	17.34	1 52.95	0.426	15 47.50	1 8.54	4 51 12.93
	5	4 53 26.66	10.298	22 34 11.0	16.35	1 42.55	0.440	15 47.38	1 8.59	4 55 9.49
	6	4 57 33.96	10.311	+22 40 31.6	+15.36	−1 31.83	+0.453	15 47.27	1 8.64	4 59 6.05
	7	5 1 41.56	10.322	22 46 28.4	14.37	1 20.82	0.464	15 47.16	1 8.68	5 3 2.61
	8	5 5 49.42	10.333	22 52 1.2	13.36	1 9.56	0.475	15 47.05	1 8.72	5 6 59.17
	9	5 9 57.53	10.343	22 57 9.8	12.36	0 58.03	0.485	15 46.95	1 8.76	5 10 55.72
	10	5 14 5.87	10.352	23 1 54.3	11.35	0 46.29	0.494	15 46.85	1 8.79	5 14 52.28
	11	5 18 14.41	10.360	+23 6 14.5	+10.33	−0 34.34	+0.502	15 46.75	1 8.82	5 18 48.84
	12	5 22 23.14	10.367	23 10 10.3	9.32	0 22.20	0.509	15 46.66	1 8.84	5 22 45.40
	13	5 26 32.04	10.374	23 13 41.7	8.30	−0 9.89	0.516	15 46.57	1 8.86	5 26 41.96
	14	5 30 41.08	10.380	23 16 48.5	7.27	+0 2.56	0.521	15 46.48	1 8.88	5 30 38.51
	15	5 34 50.25	10.385	23 19 30.8	6.25	0 15.13	0.526	15 46.40	1 8.90	5 34 35.07
	16	5 38 59.54	10.389	+23 21 48.4	+ 5.22	+0 27.82	+0.531	15 46.33	1 8.92	5 38 31.63
	17	5 43 8.92	10.393	23 23 41.3	4.19	0 40.61	0.535	15 46.26	1 8.93	5 42 28.19
	18	5 47 18.38	10.396	23 25 9.5	3.16	0 53.48	0.538	15 46.19	1 8.94	5 46 24.75
	19	5 51 27.90	10.398	23 26 12.9	2.12	1 6.41	0.539	15 46.12	1 8.94	5 50 21.30
	20	5 55 37.46	10.390	23 26 51.5	1.09	1 19.37	0.540	15 46.05	1 8.94	5 54 17.86
	21	5 59 47.03	10.390	+23 27 5.3	+ 0.06	+1 32.35	+0.541	15 45.99	1 8.94	5 58 14.42
	22	6 3 56.60	10.398	23 26 54.3	− 0.98	1 45.33	0.540	15 45.93	1 8.94	6 2 10.98
	23	6 8 6.14	10.396	23 26 18.4	2.01	1 58.28	0.538	15 45.87	1 8.93	6 6 7.54
	24	6 12 15.62	10.394	23 25 17.7	3.04	2 11.17	0.535	15 45.82	1 8.92	6 10 4.10
	25	6 16 25.03	10.390	23 23 52.3	4.07	2 23.98	0.532	15 45.77	1 8.91	6 14 0.66
	26	6 20 34.33	10.385	+23 22 2.1	− 5.11	+2 36.69	+0.527	15 45.73	1 8.89	6 17 57.21
	27	6 24 43.50	10.379	23 19 47.2	6.14	2 49.26	0.521	15 45.70	1 8.87	6 21 53.77
	28	6 28 52.51	10.372	23 17 7.6	7.16	3 1.68	0.514	15 45.68	1 8.84	6 25 50.33
	29	6 33 1.33	10.363	23 14 3.5	8.18	3 13.91	0.505	15 45.66	1 8.81	6 29 46.89
	30	6 37 9.94	10.354	23 10 34.9	9.20	3 25.93	0.496	15 45.64	1 8.78	6 33 43.45
ly	1	6 41 18.31	10.343	+23 6 42.0	−10.21	+3 37.71	+0.486	15 45.63	1 8.74	6 37 40.00
	2	6 45 26.42	10.332	+23 2 24.8	−11.22	+3 49.24	+0.474	15 45.62	1 8.71	6 41 36.56

NOTE.—For mean time interval of semidiameter passing meridian, subtract $0^s.19$ from the sidereal interval.

FOR WASHINGTON APPARENT NOON.

Date.		Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Equation of Time. Mean−App.	Var. per Hour.	Semi-diameter.	S. T. of Sem. Pass. Merid.	Sidereal Time of Mean Noon.
		h m s	s	° ′ ″	″	m s	s	′ ″	m s	h m s
July	1	6 41 18.31	10.343	+23 6 42.0	−10.21	+3 37.71	+0.486	15 45.63	1 8.74	6 37 40.00
	2	6 45 26.42	10.332	23 2 24.8	11.22	3 49.24	0.474	15 45.62	1 8.71	6 41 36.56
	3	6 49 34.25	10.320	22 57 43.5	12.22	4 0.47	0.461	15 45.62	1 8.67	6 45 33.12
	4	6 53 41.76	10.306	22 52 38.2	13.22	4 11.39	0.448	15 45.62	1 8.63	6 49 29.68
	5	6 57 48.94	10.292	22 47 8.9	14.21	4 21.98	0.434	15 45.63	1 8.58	6 53 26.24
	6	7 1 55.76	10.277	+22 41 16.0	−15.20	+4 32.22	+0.419	15 45.65	1 8.53	6 57 22.80
	7	7 6 2.21	10.261	22 34 59.5	16.18	4 42.09	0.403	15 45.67	1 8.48	7 1 19.35
	8	7 10 8.26	10.244	22 28 19.5	17.15	4 51.55	0.386	15 45.70	1 8.43	7 5 15.91
	9	7 14 13.90	10.226	22 21 16.4	18.11	5 0.61	0.368	15 45.73	1 8.37	7 9 12.47
	10	7 18 19.10	10.207	22 13 50.2	19.07	5 9.23	0.350	15 45.76	1 8.31	7 13 9.02
	11	7 22 23.85	10.188	+22 6 1.1	−20.02	+5 17.40	+0.331	15 45.80	1 8.25	7 17 5.58
	12	7 26 28.14	10.169	21 57 49.3	20.96	5 25.11	0.311	15 45.84	1 8.19	7 21 2.14
	13	7 30 31.95	10.149	21 49 15.0	21.89	5 32.34	0.291	15 45.89	1 8.12	7 24 58.70
	14	7 34 35.28	10.128	21 40 18.4	22.82	5 39.09	0.271	15 45.94	1 8.05	7 28 55.26
	15	7 38 38.11	10.108	21 30 59.5	23.75	5 45.35	0.250	15 45.99	1 7.98	7 32 51.81
	16	7 42 40.45	10.087	+21 21 18.7	−24.66	+5 51.11	+0.230	15 46.04	1 7.91	7 36 48.37
	17	7 46 42.28	10.066	21 11 16.1	25.56	5 56.37	0.209	15 46.10	1 7.84	7 40 44.93
	18	7 50 43.59	10.044	21 0 51.9	26.45	6 1.12	0.187	15 46.15	1 7.76	7 44 41.49
	19	7 54 44.38	10.022	20 50 6.4	27.34	6 5.35	0.165	15 46.21	1 7.68	7 48 38.04
	20	7 58 44.65	10.000	20 38 59.8	28.21	6 9.05	0.143	15 46.27	1 7.60	7 52 34.60
	21	8 2 44.38	9.977	+20 27 32.2	−29.08	+6 12.20	+0.120	15 46.34	1 7.52	7 56 31.16
	22	8 6 43.56	9.954	20 15 43.9	29.94	6 14.82	0.098	15 46.42	1 7.44	8 0 27.72
	23	8 10 42.19	9.931	20 3 35.2	30.79	6 16.89	0.074	15 46.50	1 7.36	8 4 24.27
	24	8 14 40.25	9.907	19 51 6.3	31.62	6 18.39	0.050	15 46.59	1 7.28	8 8 20.83
	25	8 18 37.74	9.883	19 38 17.6	32.44	6 19.31	0.027	15 46.68	1 7.19	8 12 17.39
	26	8 22 34.65	9.859	+19 25 9.2	−33.26	+6 19.67	+0.003	15 46.78	1 7.11	8 16 13.94
	27	8 26 30.97	9.834	19 11 41.3	34.06	6 19.43	−0.022	15 46.88	1 7.02	8 20 10.50
	28	8 30 26.69	9.809	18 57 54.4	34.85	6 18.60	0.047	15 46.98	1 6.94	8 24 7.05
	29	8 34 21.82	9.785	18 43 48.7	35.62	6 17.17	0.072	15 47.09	1 6.85	8 28 3.61
	30	8 38 16.35	9.759	18 29 24.5	36.39	6 15.15	0.097	15 47.21	1 6.76	8 32 0.17
	31	8 42 10.27	9.734	+18 14 42.2	−37.14	+6 12.52	−0.122	15 47.33	1 6.67	8 35 56.72
Aug.	1	8 46 3.57	9.708	17 59 41.9	37.88	6 9.28	0.148	15 47.45	1 6.58	8 39 53.28
	2	8 49 56.26	9.682	17 44 24.1	38.60	6 5.42	0.174	15 47.58	1 6.50	8 43 49.84
	3	8 53 48.33	9.657	17 28 49.0	39.32	6 0.94	0.199	15 47.71	1 6.41	8 47 46.39
	4	8 57 39.78	9.631	17 12 56.9	40.02	5 55.85	0.225	15 47.85	1 6.33	8 51 42.95
	5	9 1 30.61	9.605	+16 56 48.2	−40.70	+5 50.14	−0.251	15 47.99	1 6.24	8 55 39.50
	6	9 5 20.82	9.579	16 40 23.2	41.38	5 43.82	0.276	15 48.14	1 6.16	8 59 36.06
	7	9 9 10.42	9.554	16 23 42.1	42.04	5 36.88	0.302	15 48.29	1 6.07	9 3 32.62
	8	9 12 59.42	9.529	16 6 45.4	42.69	5 29.34	0.327	15 48.45	1 5.98	9 7 29.17
	9	9 16 47.81	9.504	15 49 33.2	43.33	5 21.20	0.351	15 48.61	1 5.90	9 11 25.73
	10	9 20 35.60	9.479	+15 32 5.8	−43.95	+5 12.47	−0.376	15 48.77	1 5.82	9 15 22.28
	11	9 24 22.81	9.455	15 14 23.6	44.56	5 3.15	0.400	15 48.94	1 5.74	9 19 18.84
	12	9 28 9.45	9.432	14 56 26.9	45.16	4 53.25	0.424	15 49.11	1 5.66	9 23 15.40
	13	9 31 55.53	9.409	14 38 15.9	45.75	4 42.80	0.447	15 49.28	1 5.58	9 27 11.95
	14	9 35 41.06	9.386	14 19 50.8	46.33	4 31.80	0.469	15 49.45	1 5.50	9 31 8.50
	15	9 39 26.05	9.364	+14 1 12.1	−46.89	+4 20.27	−0.491	15 49.62	1 5.42	9 35 5.06
	16	9 43 10.52	9.342	+13 42 20.0	−47.45	+4 8.22	−0.512	15 49.80	1 5.34	9 39 1.62

Note.—For mean time interval of semidiameter passing meridian, subtract $0^{s}.18$ *from the sidereal interval.*

FOR WASHINGTON APPARENT NOON.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Equation of Time. Mean−App.	Var. per Hour.	Semi-diameter.	S. T. of Sem. Pass. Merid.	Sidereal Time of Mean Noon.
	h m s	s	° ′ ″	″	m s	s	′ ″	m s	h m s
ug. 16	9 43 10.52	9.342	+13 42 20.0	−47.45	+ 4 8.22	−0.512	15 49.80	1 5.34	9 39 1.62
17	9 46 54.48	9.321	13 23 14.6	47.99	3 55.67	0.533	15 49.98	1 5.27	9 42 58.17
18	9 50 37.95	9.301	13 3 56.4	48.52	3 42.63	0.553	15 50.16	1 5.20	9 46 54.72
19	9 54 20.95	9.282	12 44 25.6	49.04	3 29.10	0.573	15 50.34	1 5.13	9 50 51.28
20	9 58 3.48	9.262	12 24 42.7	49.54	3 15.11	0.592	15 50.53	1 5.06	9 54 47.83
21	10 1 45.54	9.243	+12 4 47.8	−50.03	+ 3 0.66	−0.611	15 50.72	1 4.99	9 58 44.39
22	10 5 27.16	9.225	11 44 41.3	50.51	2 45.76	0.630	15 50.91	1 4.92	10 2 40.94
23	10 9 8.34	9.207	11 24 23.6	50.97	2 30.43	0.647	15 51.11	1 4.86	10 6 37.50
24	10 12 49.10	9.190	11 3 55.0	51.42	2 14.69	0.664	15 51.31	1 4.79	10 10 34.05
25	10 16 29.46	9.173	10 43 15.7	51.85	1 58.54	0.681	15 51.51	1 4.73	10 14 30.61
26	10 20 9.42	9.157	+10 22 26.2	−52.27	+ 1 41.98	−0.698	15 51.72	1 4.67	10 18 27.16
27	10 23 48.99	9.141	10 1 26.8	52.63	1 25.04	0.714	15 51.94	1 4.61	10 22 23.72
28	10 27 28.19	9.126	9 40 17.7	53.07	1 7.73	0.729	15 52.16	1 4.56	10 26 20.27
29	10 31 7.03	9.111	9 18 59.4	53.45	0 50.07	0.743	15 52.38	1 4.50	10 30 16.82
30	10 34 45.52	9.097	8 57 32.3	53.81	0 32.06	0.757	15 52.60	1 4.45	10 34 13.38
31	10 38 23.67	9.083	+ 8 35 56.7	−54.16	+ 0 13.71	−0.771	15 52.83	1 4.40	10 38 9.93
ept. 1	10 42 1.51	9.070	8 14 12.8	54.49	− 0 4.96	0.784	15 53.06	1 4.36	10 42 6.49
2	10 45 39.03	9.057	7 52 21.2	54.81	0 23.93	0.797	15 53.29	1 4.32	10 46 3.04
3	10 49 16.26	9.045	7 30 22.0	55.12	0 43.20	0.809	15 53.53	1 4.28	10 49 59.59
4	10 52 53.22	9.034	7 8 15.6	55.41	1 2.75	0.820	15 53.77	1 4.24	10 53 56.15
5	10 56 29.92	9.024	+ 6 46 2.3	−55.69	− 1 22.56	−0.830	15 54.02	1 4.21	10 57 52.70
6	11 0 6.36	9.014	6 23 42.5	55.95	1 42.61	0.840	15 54.27	1 4.18	11 1 49.26
7	11 3 42.58	9.005	6 1 16.6	56.20	2 2.89	0.849	15 54.52	1 4.15	11 5 45.81
8	11 7 18.60	8.997	5 38 44.8	56.44	2 23.37	0.857	15 54.77	1 4.12	11 9 42.36
9	11 10 54.44	8.990	5 16 7.4	56.67	2 44.03	0.864	15 55.02	1 4.10	11 13 38.92
10	11 14 30.11	8.983	+ 4 53 24.6	−56.89	− 3 4.85	−0.870	15 55.27	1 4.08	11 17 35.47
11	11 18 5.65	8.978	4 30 36.9	57.09	3 25.81	0.876	15 55.52	1 4.06	11 21 32.02
12	11 21 41.08	8.974	4 7 44.5	57.28	3 46.88	0.880	15 55.78	1 4.04	11 25 28.58
13	11 25 16.42	8.971	3 44 47.6	57.46	4 8.04	0.883	15 56.03	1 4.03	11 29 25.13
14	11 28 51.69	8.969	3 21 46.6	57.62	4 29.26	0.885	15 56.29	1 4.02	11 33 21.68
15	11 32 26.92	8.967	+ 2 58 41.9	−57.77	− 4 50.53	−0.887	15 56.54	1 4.02	11 37 18.24
16	11 36 2.12	8.966	2 35 33.7	57.91	5 11.82	0.887	15 56.80	1 4.01	11 41 14.79
17	11 39 37.32	8.967	2 12 22.3	58.04	5 33.11	0.886	15 57.05	1 4.01	11 45 11.34
18	11 43 12.55	8.969	1 49 8.0	58.15	5 54.37	0.885	15 57.31	1 4.01	11 49 7.90
19	11 46 47.83	8.971	1 25 51.2	58.25	6 15.60	0.883	15 57.57	1 4.02	11 53 4.45
20	11 50 23.16	8.974	+ 1 2 32.3	−58.33	− 6 36.76	−0.880	15 57.83	1 4.03	11 57 1.00
21	11 53 58.57	8.978	0 39 11.6	58.40	6 57.84	0.876	15 58.10	1 4.04	12 0 57.56
22	11 57 34.09	8.982	+ 0 15 49.4	58.45	7 18.81	0.871	15 58.36	1 4.05	12 4 54.11
23	12 1 9.73	8.988	− 0 7 33.9	58.49	7 39.66	0.866	15 58.63	1 4.07	12 8 50.66
24	12 4 45.51	8.994	0 30 57.9	58.51	8 0.38	0.860	15 58.90	1 4.09	12 12 47.21
25	12 8 21.45	9.001	− 0 54 22.3	−58.52	− 8 20.95	−0.853	15 59.17	1 4.11	12 16 43.77
26	12 11 57.56	9.008	1 17 46.7	58.51	8 41.34	0.845	15 59.44	1 4.14	12 20 40.32
27	12 15 33.86	9.017	1 41 10.7	58.49	9 1.53	0.837	15 59.71	1 4.17	12 24 36.87
28	12 19 10.37	9.026	2 4 34.0	58.45	9 21.51	0.828	15 59.98	1 4.20	12 28 33.43
29	12 22 47.11	9.036	2 27 56.2	58.40	9 41.26	0.818	16 0.26	1 4.24	12 32 29.98
30	12 26 24.10	9.046	− 2 51 17.0	−58.33	−10 0.77	−0.808	16 0.54	1 4.28	12 36 26.53
ct. 1	12 30 1.35	9.058	− 3 14 35.9	−58.24	−10 20.03	−0.797	16 0.82	1 4.32	12 40 23.09

NOTE.—For mean time interval of semidiameter passing meridian, subtract $0^{s}.18$ from the sidereal interval.

FOR WASHINGTON APPARENT NOON.

Date.		Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Equation of Time. Mean—App.	Var. per Hour.	Semi-diameter.	S. T. of Sem. Pass. Merid.	Sidereal Time of Mean Noon.
		h m s	s	° ′ ″	″	m s	s	′ ″	m s	h m s
Oct.	1	12 30 1.35	9.058	− 3 14 35.9	−58.24	−10 20.03	−0.797	16 0.82	1 4.32	12 40 23.09
	2	12 33 38.88	9.070	3 37 52.5	58.14	10 39.01	0.785	16 1.10	1 4.36	12 44 19.64
	3	12 37 16.70	9.082	4 1 6.5	58.03	10 57.69	0.772	16 1.38	1 4.41	12 48 16.19
	4	12 40 54.83	9.096	4 24 17.6	57.90	11 16.06	0.759	16 1.66	1 4.46	12 52 12.75
	5	12 44 33.30	9.110	4 47 25.5	57.75	11 34.10	0.744	16 1.95	1 4.51	12 56 9.30
	6	12 48 12.13	9.125	− 5 10 29.7	−57.59	−11 51.78	−0.729	16 2.24	1 4.57	13 0 5.85
	7	12 51 51.33	9.141	5 33 29.9	57.42	12 9.08	0.713	16 2.52	1 4.63	13 4 2.41
	8	12 55 30.93	9.159	5 56 25.7	57.23	12 25.99	0.696	16 2.80	1 4.69	13 7 58.96
	9	12 59 10.95	9.177	6 19 16.8	57.03	12 42.48	0.678	16 3.08	1 4.76	13 11 55.51
	10	13 2 51.41	9.195	6 42 2.9	56.81	12 58.53	0.659	16 3.36	1 4.83	13 15 52.07
	11	13 6 32.34	9.215	− 7 4 43.7	−56.58	−13 14.11	−0.639	16 3.64	1 4.90	13 19 48.62
	12	13 10 13.76	9.236	7 27 18.8	56.34	13 29.20	0.618	16 3.92	1 4.98	13 23 45.18
	13	13 13 55.70	9.258	7 49 47.8	56.08	13 43.77	0.596	16 4.19	1 5.06	13 27 41.73
	14	13 17 38.17	9.281	8 12 10.4	55.80	13 57.82	0.574	16 4.46	1 5.14	13 31 38.28
	15	13 21 21.20	9.305	8 34 26.3	55.51	14 11.31	0.550	16 4.73	1 5.22	13 35 34.84
	16	13 25 4.81	9.329	− 8 56 35.0	−55.21	−14 24.22	−0.526	16 5.00	1 5.30	13 39 31.39
	17	13 28 49.01	9.354	9 18 36.2	54.89	14 36.53	0.500	16 5.27	1 5.38	13 43 27.94
	18	13 32 33.83	9.380	9 40 29.4	54.55	14 48.23	0.474	16 5.54	1 5.47	13 47 24.50
	19	13 36 19.28	9.407	10 2 14.3	54.19	14 59.30	0.448	16 5.80	1 5.56	13 51 21.05
	20	13 40 5.37	9.434	10 23 50.5	53.82	15 9.73	0.421	16 6.07	1 5.65	13 55 17.61
	21	13 43 52.13	9.462	−10 45 17.6	−53.43	−15 19.50	−0.393	16 6.33	1 5.74	13 59 14.16
	22	13 47 39.57	9.491	11 6 35.1	53.02	15 28.59	0.364	16 6.60	1 5.84	14 3 10.71
	23	13 51 27.71	9.520	11 27 42.7	52.60	15 36.99	0.335	16 6.86	1 5.94	14 7 7.27
	24	13 55 16.55	9.550	11 48 40.0	52.17	15 44.69	0.306	16 7.13	1 6.04	14 11 3.82
	25	13 59 6.11	9.580	12 9 26.5	51.71	15 51.66	0.276	16 7.39	1 6.14	14 15 0.38
	26	14 2 56.40	9.611	−12 30 1.8	−51.23	−15 57.91	−0.245	16 7.65	1 6.24	14 18 56.93
	27	14 6 47.42	9.641	12 50 25.5	50.74	16 3.43	0.214	16 7.91	1 6.35	14 22 53.49
	28	14 10 39.19	9.673	13 10 37.2	50.23	16 8.20	0.183	16 8.17	1 6.46	14 26 50.04
	29	14 14 31.71	9.704	13 30 36.4	49.70	16 12.22	0.152	16 8.43	1 6.57	14 30 46.60
	30	14 18 25.00	9.736	13 50 22.7	49.15	16 15.48	0.120	16 8.68	1 6.68	14 34 43.15
	31	14 22 19.05	9.768	−14 9 55.7	−48.59	−16 17.97	−0.088	16 8.94	1 6.79	14 38 39.71
Nov.	1	14 26 13.88	9.801	14 29 15.1	48.02	16 19.68	0.055	16 9.19	1 6.91	14 42 36.26
	2	14 30 9.50	9.834	14 48 20.4	47.42	16 20.63	−0.023	16 9.45	1 7.03	14 46 32.82
	3	14 34 5.90	9.867	15 7 11.1	46.80	16 20.79	+0.010	16 9.70	1 7.15	14 50 29.37
	4	14 38 3.10	9.900	15 25 46.9	46.17	16 20.15	0.044	16 9.95	1 7.27	14 54 25.93
	5	14 42 1.10	9.934	−15 44 7.3	−45.53	−16 18.70	+0.077	16 10.20	1 7.39	14 58 22.48
	6	14 45 59.92	9.968	16 2 12.1	44.87	16 16.44	0.111	16 10.45	1 7.51	15 2 19.04
	7	14 49 59.57	10.003	16 20 0.8	44.19	16 13.36	0.146	16 10.69	1 7.63	15 6 15.60
	8	14 54 0.05	10.038	16 37 33.1	43.50	16 9.44	0.181	16 10.92	1 7.74	15 10 12.15
	9	14 58 1.37	10.073	16 54 48.6	42.79	16 4.69	0.216	16 11.15	1 7.86	15 14 8.71
	10	15 2 3.54	10.108	−17 11 46.9	−42.06	−15 59.10	+0.251	16 11.38	1 7.98	15 18 5.26
	11	15 6 6.56	10.144	17 28 27.5	41.32	15 52.66	0.286	16 11.61	1 8.10	15 22 1.82
	12	15 10 10.44	10.180	17 44 50.1	40.56	15 45.36	0.322	16 11.83	1 8.22	15 25 58.38
	13	15 14 15.18	10.215	18 0 54.3	39.79	15 37.19	0.358	16 12.04	1 8.34	15 29 54.93
	14	15 18 20.78	10.251	18 16 39.8	39.00	15 28.17	0.394	16 12.25	1 8.46	15 33 51.49
	15	15 22 27.25	10.287	−18 32 6.1	−38.19	−15 18.29	+0.430	16 12.46	1 8.58	15 37 48.05
	16	15 26 34.58	10.323	−18 47 12.7	−37.36	−15 7.54	+0.466	16 12.66	1 8.70	15 41 44.60

Note.—For mean time interval of semidiameter passing meridian, subtract $0^{s}.18$ from the sidereal interval.

FOR WASHINGTON APPARENT NOON.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Equation of Time. Mean−App.	Var. per Hour.	Semi-diameter.	S. T. of Sem. Pass. Merid.	Sidereal Time of Mean Noon.
	h m s	s	° ′ ″	″	m s	s	′ ″	m s	h m s
Nov. 16	15 26 34.58	10.323	−18 47 12.7	−37.30	−15 7.54	+0.466	16 12.66	1 8.70	15 41 44.60
17	15 30 42.77	10.359	19 1 59.4	36.53	14 55.93	0.501	16 12.86	1 8.81	15 45 41.16
18	15 34 51.81	10.394	19 16 25.8	35.67	14 43.48	0.536	16 13.06	1 8.92	15 49 37.72
19	15 39 1.70	10.430	19 30 31.4	34.80	14 30.18	0.572	16 13.26	1 9.03	15 53 34.27
20	15 43 12.44	10.465	19 44 15.9	33.91	14 16.04	0.607	16 13.45	1 9.14	15 57 30.83
21	15 47 24.00	10.499	−19 57 38.9	−33.00	−14 1.08	+0.641	16 13.64	1 9.25	16 1 27.39
22	15 51 36.38	10.533	20 10 40.0	32.08	13 45.30	0.675	16 13.83	1 9.36	16 5 23.94
23	15 55 49.57	10.566	20 23 18.8	31.15	13 28.71	0.708	16 14.02	1 9.47	16 9 20.50
24	16 0 3.55	10.599	20 35 34.9	30.20	13 11.33	0.740	16 14.20	1 9.58	16 13 17.06
25	16 4 18.31	10.631	20 47 28.1	29.24	12 53.19	0.771	16 14.38	1 9.69	16 17 13.61
26	16 8 33.81	10.661	−20 58 58.1	−28.26	−12 34.30	+0.802	16 14.55	1 9.79	16 21 10.17
27	16 12 50.04	10.691	21 10 4.4	27.26	12 14.67	0.832	16 14.72	1 9.89	16 25 6.73
28	16 17 6.99	10.721	21 20 46.6	26.25	11 54.34	0.861	16 14.89	1 9.99	16 29 3.29
29	16 21 24.62	10.749	21 31 4.5	25.24	11 33.32	0.890	16 15.05	1 10.08	16 32 59.84
30	16 25 42.91	10.776	21 40 57.8	24.20	11 11.64	0.917	16 15.21	1 10.17	16 36 56.40
Dec. 1	16 30 1.85	10.802	−21 50 26.2	−23.16	−10 49.33	+0.943	16 15.37	1 10.26	16 40 52.96
2	16 34 21.41	10.827	21 59 29.6	22.11	10 26.40	0.968	16 15.53	1 10.35	16 44 49.52
3	16 38 41.56	10.852	22 8 7.4	21.04	10 2.87	0.992	16 15.69	1 10.43	16 48 46.08
4	16 43 2.29	10.875	22 16 19.5	19.97	9 38.76	1.016	16 15.84	1 10.51	16 52 42.64
5	16 47 23.57	10.898	22 24 5.8	18.80	9 14.10	1.039	16 15.98	1 10.58	16 56 39.19
6	16 51 45.39	10.920	−22 31 25.9	−17.79	− 8 48.90	+1.061	16 16.12	1 10.65	17 0 35.75
7	16 56 7.72	10.941	22 38 19.6	16.69	8 23.20	1.081	16 16.25	1 10.72	17 4 32.31
8	17 0 30.54	10.961	22 44 46.7	15.57	7 57.02	1.101	16 16.38	1 10.79	17 8 28.87
9	17 4 53.82	10.979	22 50 47.0	14.45	7 30.37	1.119	16 16.50	1 10.86	17 12 25.43
10	17 9 17.54	10.997	22 56 20.3	13.32	7 3.29	1.137	16 16.61	1 10.92	17 16 21.99
11	17 13 41.67	11.014	−23 1 26.4	−12.19	− 6 35.79	+1.154	16 16.72	1 10.97	17 20 18.54
12	17 18 6.19	11.029	23 6 5.1	11.04	6 7.90	1.169	16 16.82	1 11.02	17 24 15.10
13	17 22 31.06	11.043	23 10 16.3	9.89	5 39.66	1.183	16 16.92	1 11.06	17 28 11.66
14	17 26 56.25	11.056	23 13 59.9	8.74	5 11.11	1.196	16 17.01	1 11.10	17 32 8.22
15	17 31 21.75	11.069	23 17 15.7	7.58	4 42.25	1.208	16 17.09	1 11.14	17 36 4.78
16	17 35 47.53	11.079	−23 20 3.6	− 6.41	− 4 13.12	+1.219	16 17.17	1 11.17	17 40 1.34
17	17 40 13.54	11.088	23 22 23.4	5.24	3 43.75	1.228	16 17.24	1 11.19	17 43 57.90
18	17 44 39.75	11.096	23 24 15.1	4.07	3 14.18	1.236	16 17.31	1 11.21	17 47 54.45
19	17 49 6.13	11.102	23 25 38.6	2.89	2 44.44	1.242	16 17.37	1 11.23	17 51 51.01
20	17 53 32.64	11.107	23 26 33.9	1.71	2 14.56	1.247	16 17.43	1 11.24	17 55 47.57
21	17 57 59.25	11.110	−23 27 0.8	− 0.53	− 1 44.59	+1.250	16 17.49	1 11.25	17 59 44.13
22	18 2 25.93	11.112	23 26 59.3	+ 0.65	1 14.56	1.252	16 17.55	1 11.25	18 3 40.69
23	18 6 52.63	11.113	23 26 29.5	1.83	0 44.50	1.252	16 17.60	1 11.25	18 7 37.25
24	18 11 19.32	11.111	23 25 31.4	3.01	− 0 14.45	1.251	16 17.65	1 11.25	18 11 33.81
25	18 15 45.94	11.107	23 24 5.0	4.19	+ 0 15.53	1.248	16 17.69	1 11.24	18 15 30.36
26	18 20 12.46	11.102	−23 22 10.3	+ 5.37	+ 0 45.42	+1.243	16 17.73	1 11.23	18 19 26.92
27	18 24 38.85	11.096	23 19 47.4	6.54	1 15.18	1.236	16 17.76	1 11.21	18 23 23.48
28	18 29 5.07	11.089	23 16 56.3	7.71	1 44.76	1.228	16 17.79	1 11.18	18 27 20.04
29	18 33 31.09	11.079	23 13 37.2	8.88	2 14.13	1.219	16 17.81	1 11.15	18 31 16.60
30	18 37 56.86	11.068	23 9 50.3	10.03	2 43.25	1.207	16 17.83	1 11.12	18 35 13.16
31	18 42 22.34	11.055	−23 5 35.6	+11.19	+ 3 12.08	+1.195	16 17.85	1 11.09	18 39 9.71
32	18 46 47.50	11.041	−23 0 53.3	+12.34	+ 3 40.61	+1.182	16 17.87	1 11.05	18 43 6.27

Note.—For mean time interval of semidiameter passing meridian, subtract $0^{s}.19$ from the sidereal interval.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Jan. 0	U	20 19.73	2.454	14 59 14.67	157.51	−22 21 26.6	−606.9	73.91	16 22.3	59 59.2	II. S.
1	L	8 49.89	2.570	15 31 27.15	164.49	24 11 41.9	492.1	75.56	16 28.7	60 22.5	
1	U	21 21.36	2.673	16 4 59.15	170.66	25 36 56.4	357.0	76.99	16 34.2	60 42.8	II. S.
2	L	9 53.94	2.751	16 39 37.14	175.38	26 33 24.0	204.9	78.06	16 38.7	60 59.4	
2	U	22 27.26	2.796	17 15 0.18	178.09	−26 58 7.7	− 40.9	78.65	16 42.0	61 11.5	II. N.
3	L	11 0.89	2.802	17 50 41.72	178.43	26 49 27.2	+127.8	78.71	16 43.9	61 18.6	
3	U	23 34.34	2.768	18 26 12.93	176.38	26 7 15.0	293.0	78.23	16 44.4	61 20.3	
4	L	12 7.18	2.699	19 1 6.66	172.26	24 53 0.1	447.0	77.26	16 43.3	61 16.4	
5	U	0 39.02	2.605	19 35 0.91	166.58	−23 9 35.4	+583.7	75.93	16 40.8	61 7.1	
5	L	13 9.63	2.495	20 7 40.89	159.99	21 0 54.6	699.3	74.36	16 36.9	60 52.8	
6	U	1 38.89	2.380	20 38 59.37	153.09	18 31 22.8	792.1	72.69	16 31.7	60 33.8	I. S.
6	L	14 6.78	2.269	21 8 55.66	146.36	15 45 33.0	862.5	71.04	16 25.5	60 10.9	
7	U	2 33.38	2.166	21 37 34.12	140.16	−12 47 47.2	+911.8	69.49	16 18.4	59 45.0	I. S.
7	L	14 58.81	2.075	22 5 2.47	134.70	9 42 4.5	942.3	68.11	16 10.7	59 16.8	
8	U	3 23.24	1.999	22 31 30.38	130.10	6 31 55.9	956.5	66.93	16 2.7	58 47.2	I. S.
8	L	15 46.84	1.937	22 57 8.47	126.40	3 20 23.4	956.7	65.97	15 54.4	58 16.9	
9	U	4 9.79	1.890	23 22 7.56	123.60	− 0 10 2.6	+944.9	65.24	15 46.2	57 46.6	I. S.
9	L	16 32.27	1.858	23 46 38.23	121.67	+ 2 56 54.2	923.0	64.74	15 38.1	57 17.0	
10	U	4 54.44	1.840	0 10 50.61	120.54	5 58 33.9	892.2	64.45	15 30.4	56 48.6	I. S.
10	L	17 16.47	1.834	0 34 54.12	120.17	8 53 17.0	853.7	64.37	15 23.1	56 21.8	
11	U	5 38.49	1.839	0 58 57.47	120.49	+11 39 34.8	+808.1	64.46	15 16.3	55 57.0	I. S.
11	L	18 0.64	1.854	1 23 8.42	121.43	14 16 4.9	755.8	64.73	15 10.1	55 34.3	
12	U	6 23.03	1.879	1 47 33.80	122.88	16 41 29.3	697.2	65.11	15 4.6	55 14.1	I. S.
12	L	18 45.75	1.910	2 12 19.18	124.75	18 54 31.9	632.2	65.60	14 59.8	54 56.3	
13	U	7 8.88	1.945	2 37 28.84	126.90	+20 53 57.3	+560.9	66.16	14 55.6	54 41.0	I. S.
13	L	19 32.45	1.984	3 3 5.42	129.20	22 38 31.2	483.6	66.75	14 52.1	54 28.3	
14	U	7 56.49	2.022	3 29 9.73	131.49	24 7 1.3	400.4	67.33	14 49.3	54 18.0	I. S.
14	L	20 20.97	2.057	3 55 40.63	133.61	25 18 19.7	311.8	67.85	14 47.2	54 10.1	
15	U	8 45.83	2.086	4 22 34.92	135.37	+26 11 25.4	+218.5	68.27	14 45.7	54 4.6	I. S.
15	L	21 11.00	2.107	4 49 47.49	136.63	26 45 28.5	121.5	68.57	14 44.8	54 1.2	
16	U	9 36.36	2.118	5 17 11.59	137.28	26 59 53.4	+ 22.4	68.69	14 44.4	53 59.8	I. N.*S.*
16	L	22 1.78	2.117	5 44 39.37	137.24	26 54 22.1	− 77.6	68.64	14 44.5	54 0.3	
17	U	10 27.13	2.105	6 12 2.51	136.51	+26 28 56.0	−176.5	68.42	14 45.1	54 2.5	I. N.
17	L	22 52.26	2.082	6 39 12.99	135.14	25 43 57.2	272.7	68.04	14 46.1	54 6.3	
18	U	11 17.07	2.051	7 6 3.73	133.24	24 40 7.2	364.7	67.52	14 47.6	54 11.6	I. N.
18	L	23 41.46	2.013	7 32 29.14	130.94	23 18 24.1	451.3	66.90	14 49.3	54 18.1	
19	U	12 5.36	1.971	7 58 25.46	128.41	+21 40 0.7	−531.4	66.22	14 51.4	54 25.8	I. *II.* N.*S.*
20	L	0 28.75	1.928	8 23 50.93	125.82	19 46 20.1	604.1	65.53	14 53.8	54 34.6	
20	U	12 51.63	1.886	8 48 45.71	123.33	17 38 52.2	669.2	64.87	14 56.5	54 44.5	II. S.
21	L	1 14.03	1.848	9 13 11.75	121.06	15 19 11.1	726.3	64.26	14 59.5	54 55.3	
21	U	13 36.01	1.816	9 37 12.53	119.14	+12 48 53.3	−775.3	63.76	15 2.7	55 7.1	II. S.
22	L	1 57.65	1.792	10 0 52.88	117.66	10 9 35.3	816.4	63.38	15 6.2	55 19.8	
22	U	14 19.05	1.776	10 24 18.73	116.73	7 22 53.5	849.3	63.15	15 9.9	55 33.4	II. S.
23	L	2 40.32	1.771	10 47 36.88	116.40	4 30 24.6	874.2	63.08	15 13.8	55 48.0	
23	U	15 1.60	1.776	11 10 54.96	116.73	+ 1 33 45.4	−890.9	63.21	15 18.1	56 3.5	II. S.

Jan. 16, U Defective Illumination of *S.* 0″.02.
Jan. 19, U Defective Illumination of *II.* 0″.01.

Jan. 19, U Defective Illumination of *S.* 0″.07.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Jan. 23	U	15 1.60	1.776	11 10 54.96	116.73	+ 1 33 45.4	−890.9	63.21	15 18.1	56 3.5	II. S.
24	L	3 23.00	1.794	11 34 21.22	117.77	− 1 25 24.2	899.2	63.54	15 22.6	56 20.0	
24	U	15 44.69	1.824	11 58 4.50	119.57	4 25 21.1	898.6	64.07	15 27.4	56 37.6	II. S.
25	L	4 6.82	1.867	12 22 14.09	122.17	7 24 15.1	888.6	64.81	15 32.4	56 56.1	
25	U	16 29.55	1.923	12 46 59.62	125.56	−10 20 6.8	−868.1	65.76	15 37.7	57 15.5	II. S.
26	L	4 53.03	1.993	13 12 30.81	129.77	13 10 44.1	836.1	66.91	15 43.2	57 35.7	
26	U	17 17.43	2.076	13 38 57.15	134.74	15 53 40.0	791.0	68.23	15 48.9	57 56.6	II. S.
27	L	5 42.89	2.170	14 6 27.33	140.39	18 26 10.1	731.5	69.70	15 54.7	58 18.0	
27	U	18 9.53	2.272	14 35 8.41	146.52	−20 45 11.4	−656.0	71.27	16 0.6	58 39.6	II. S.
28	L	6 37.43	2.377	15 5 4.79	152.89	22 47 25.3	563.4	72.85	16 6.4	59 0.9	
28	U	19 6.58	2.480	15 36 17.02	159.10	24 29 23.0	453.3	74.36	16 12.1	59 21.6	II. S.
29	L	7 36.92	2.573	16 8 40.48	164.67	25 47 36.0	326.2	75.68	16 17.4	59 41.2	
29	U	20 8.26	2.647	16 42 4.61	169.12	−26 38 52.6	−184.4	76.70	16 22.2	59 59.0	II. S.
30	L	8 40.34	2.694	17 16 12.87	171.96	27 0 38.0	− 31.8	77.34	16 26.5	60 14.6	
30	U	21 12.80	2.710	17 50 43.94	172.88	26 51 13.8	+126.3	77.52	16 29.9	60 27.1	II. N.
31	L	9 45.24	2.692	18 25 14.03	171.81	26 10 13.9	283.1	77.23	16 32.4	60 36.2	
31	U	22 17.28	2.644	18 59 19.90	168.90	−24 58 30.6	+432.4	76.51	16 33.8	60 41.4	II. N.
Feb. 1	L	10 48.58	2.571	19 32 41.68	164.53	23 18 10.2	568.4	75.45	16 34.0	60 42.2	
1	U	23 18.92	2.483	20 5 4.86	159.22	21 12 18.3	687.1	74.15	16 33.0	60 38.5	
2	L	11 48.13	2.387	20 36 20.98	153.45	18 44 41.4	785.6	72.73	16 30.8	60 30.3	
3	U	0 16.19	2.290	21 6 27.34	147.66	−15 59 26.7	+863.3	71.28	16 27.4	60 17.8	
3	L	12 43.12	2.200	21 35 25.98	142.20	13 0 44.4	920.3	69.90	16 22.8	60 1.2	
4	U	1 9.02	2.118	22 3 22.32	137.30	9 52 35.3	958.0	68.66	16 17.4	59 41.2	
4	L	13 34.01	2.049	22 30 24.10	133.12	6 38 42.8	977.9	67.59	16 11.1	59 18.1	
5	U	1 58.24	1.992	22 56 40.25	129.71	− 3 22 29.1	+981.9	66.71	16 4.2	58 52.8	I. S.
5	L	14 21.87	1.949	23 22 20.27	127.10	− 0 6 53.0	971.8	66.04	15 56.9	58 25.8	
6	U	2 45.06	1.918	23 47 33.65	125.27	+ 3 5 28.5	949.7	65.58	15 49.3	57 58.0	I. S.
6	L	15 7.96	1.901	0 12 29.62	124.18	6 12 18.3	916.9	65.32	15 41.6	57 29.9	
7	U	3 30.71	1.894	0 37 16.83	123.79	+ 9 11 36.6	+874.6	65.25	15 34.1	57 2.2	I. S.
7	L	15 53.45	1.898	1 2 3.22	124.03	12 1 37.4	824.2	65.35	15 26.8	56 35.4	
8	U	4 16.30	1.911	1 26 55.86	124.82	14 40 46.2	766.1	65.59	15 19.9	56 10.0	I. S.
8	L	16 39.35	1.932	1 52 0.84	126.07	17 7 36.7	701.2	65.95	15 13.5	55 46.4	
9	U	5 2.68	1.958	2 17 22.98	127.67	+19 20 49.3	+629.9	66.40	15 7.6	55 25.0	I. S.
9	L	17 26.36	1.988	2 43 5.81	129.49	21 19 9.9	552.5	66.90	15 2.4	55 5.9	
10	U	5 50.41	2.020	3 9 11.19	131.41	23 1 29.1	469.7	67.41	14 57.9	54 49.4	I. S.
10	L	18 14.84	2.051	3 35 39.29	133.26	24 26 43.7	381.9	67.90	14 54.1	54 35.5	
11	U	6 39.62	2.078	4 2 28.53	134.90	+25 33 56.5	+289.6	68.32	14 51.1	54 24.4	I. S.
11	L	19 4.70	2.100	4 29 35.47	136.19	26 22 20.1	193.8	68.64	14 48.8	54 16.1	
12	U	7 29.98	2.113	4 56 55.12	137.00	26 51 17.8	+ 95.5	68.83	14 47.3	54 10.5	I. S.
12	L	19 55.38	2.118	5 24 21.24	137.25	27 0 27.0	− 4.1	68.86	14 46.5	54 7.5	
13	U	8 20.76	2.112	5 51 46.83	136.91	+26 49 41.1	−103.5	68.74	14 46.4	54 7.1	I. N.*S.*
13	L	20 46.02	2.096	6 19 4.74	135.98	26 19 10.0	201.3	68.46	14 46.9	54 9.1	
14	U	9 11.04	2.072	6 46 8.28	134.52	25 29 19.9	296.4	68.03	14 48.0	54 13.3	I. N.
14	L	21 35.72	2.041	7 12 51.72	132.66	24 20 53.9	387.1	67.50	14 49.7	54 19.5	
15	U	10 0.00	2.005	7 39 10.75	130.48	+22 54 48.7	−472.7	66.89	14 51.9	54 27.5	I. N.

Feb. 13, U Defective Illumination of *S.* 0″.13.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Feb. 15	U	10 0.00	2.005	7 39 10.75	130.48	+22 54 48.7	−472.7	66.89	14 51.9	54 27.5	I. N.
15	L	22 23.83	1.966	8 5 2.73	128.16	21 12 13.0	552.1	66.24	14 54.5	54 37.2	
16	U	10 47.20	1.928	8 30 26.73	125.84	19 14 25.3	624.6	65.59	14 57.5	54 48.2	I. N.
16	L	23 10.11	1.891	8 55 23.50	123.65	17 2 51.2	689.7	64.98	15 0.9	55 0.4	
17	U	11 32.61	1.859	9 19 55.36	121.71	+14 39 1.7	−747.1	64.43	15 4.5	55 13.5	I. N.*S.*
17	L	23 54.75	1.833	9 44 5.94	120.12	12 4 32.3	796.4	63.98	15 8.2	55 27.3	
18	U	12 16.62	1.814	10 8 0.01	118.97	9 21 1.7	837.3	63.66	15 12.1	55 41.7	*I.* II. *N.*S.
19	L	0 38.32	1.803	10 31 43.35	118.35	6 30 11.6	869.6	63.49	15 16.1	55 56.4	
19	U	12 59.94	1.802	10 55 22.47	118.28	+ 3 33 47.1	−893.0	63.48	15 20.2	56 11.4	II. S.
20	L	1 21.61	1.811	11 19 4.59	118.85	+ 0 33 37.0	907.1	63.66	15 24.3	56 26.5	
20	U	13 43.46	1.832	11 42 57.42	120.08	− 2 28 25.1	911.6	64.02	15 28.4	56 41.6	II. S.
21	L	2 5.62	1.864	12 7 9.11	121.99	5 30 20.1	905.9	64.57	15 32.5	56 56.6	
21	U	14 28.24	1.908	12 31 48.10	124.63	− 8 30 1.8	−889.2	65.32	15 36.6	57 11.5	II. S.
22	L	2 51.45	1.963	12 57 2.88	127.96	11 25 14.7	860.9	66.25	15 40.6	57 26.3	
22	U	15 15.39	2.030	13 23 1.76	131.97	14 13 34.0	820.1	67.35	15 44.6	57 40.8	II. S.
23	L	3 40.20	2.106	13 49 52.42	136.58	16 52 23.7	765.9	68.58	15 48.5	57 55.2	
23	U	16 5.97	2.191	14 17 41.37	141.65	−19 18 57.2	−697.3	69.93	15 52.4	58 9.4	II. S.
24	L	4 32.79	2.280	14 46 33.16	147.00	21 30 17.9	613.6	71.31	15 56.2	58 23.3	
24	U	17 0.68	2.369	15 16 29.53	152.36	23 23 23.7	514.8	72.66	15 59.8	58 36.7	II. S.
25	L	5 29.61	2.452	15 47 28.49	157.37	24 55 14.1	401.3	73.91	16 3.3	58 49.7	
25	U	17 59.48	2.523	16 19 23.58	161.65	−26 2 59.4	−274.2	74.95	16 6.7	59 2.1	II. S.
26	L	6 30.09	2.575	16 52 3.62	164.81	26 44 14.1	−136.6	75.71	16 9.8	59 13.5	
26	U	19 1.20	2.604	17 25 13.23	166.53	26 57 10.5	+ 8.0	76.11	16 12.7	59 23.8	II. S.
27	L	7 32.49	2.606	17 58 34.09	166.66	26 40 52.0	155.1	76.12	16 15.1	59 32.7	
27	U	20 3.64	2.582	18 31 46.87	165.21	−25 55 19.3	+299.5	75.74	16 17.0	59 39.8	II. N.
28	L	8 34.37	2.535	19 4 33.63	162.37	24 41 33.6	436.5	75.03	16 18.4	59 44.9	
28	U	21 4.41	2.470	19 36 39.53	158.47	23 1 29.6	561.9	74.04	16 19.1	59 47.6	II. N.
29	L	9 33.60	2.394	20 7 54.16	153.89	20 57 45.8	672.7	72.89	16 19.2	59 47.7	
29	U	22 1.85	2.313	20 38 11.79	149.03	−18 33 31.3	+766.9	71.65	16 18.4	59 44.9	II. N.
Mar. 1	L	10 29.13	2.233	21 7 31.17	144.23	15 52 12.6	843.2	70.41	16 16.8	59 39.1	
1	U	22 55.47	2.159	21 35 54.60	139.75	12 57 22.8	902.0	69.24	16 14.4	59 30.3	II. N.
2	L	11 20.97	2.093	22 3 27.13	135.77	9 52 32.7	943.4	68.20	16 11.2	59 18.5	
2	U	23 45.74	2.037	22 30 15.62	132.43	− 6 41 5.5	+968.4	67.31	16 7.2	59 3.9	
3	L	12 9.91	1.993	22 56 27.95	129.75	3 26 12.8	977.8	66.60	16 2.5	58 46.7	
4	U	0 33.62	1.960	23 22 12.51	127.79	− 0 10 52.9	973.1	66.08	15 57.2	58 27.3	
4	L	12 57.00	1.939	23 47 37.72	126.52	+ 3 2 10.3	955.3	65.75	15 51.5	58 6.2	
5	U	1 20.20	1.929	0 12 51.74	125.92	+ 6 10 27.2	+925.6	65.61	15 45.4	57 43.7	I. S.
5	L	13 43.34	1.929	0 38 2.23	125.93	9 11 40.9	885.0	65.63	15 39.0	57 20.4	
6	U	2 6.54	1.938	1 3 16.12	126.47	12 3 47.3	834.5	65.81	15 32.6	56 56.8	I. S.
6	L	14 29.89	1.955	1 28 39.44	127.49	14 44 53.4	775.1	66.11	15 26.2	56 33.4	
7	U	2 53.49	1.978	1 54 17.12	128.85	+17 13 16.6	+707.5	66.51	15 20.0	56 10.7	I. S.
7	L	15 17.38	2.005	2 20 12.81	130.47	19 27 23.8	632.6	66.98	15 14.2	55 49.1	
8	U	3 41.60	2.033	2 46 28.67	132.19	21 25 51.5	551.0	67.47	15 8.7	55 29.1	I. S.
8	L	16 6.17	2.062	3 13 5.29	133.90	23 7 25.5	463.7	67.94	15 3.7	55 10.9	
9	U	4 31.07	2.087	3 40 1.47	135.42	+24 31 2.0	+371.6	68.38	14 59.4	54 54.9	I. S.

Feb. 17, U Defective **Illumination of** *S.* **0″.40.**
Feb. 18, U Defective **Illumination of** *I.* **0″.00.**

Feb. 18, U Defective Illumination of *N.* **0″.93.**

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Mar. 9	U	4 31.07	2.087	3 40 1.47	135.42	+24 31 2.0	+371.6	68.38	14 59.4	54 54.9	I. S.
9	L	16 56.25	2.108	4 7 14.37	136.66	25 35 49.1	275.6	68.72	14 55.6	54 41.2	
10	U	5 21.63	2.121	4 34 39.59	137.46	26 21 7.7	177.0	68.94	14 52.6	54 30.2	I. S.
10	L	17 47.12	2.126	5 2 11.47	137.76	26 46 33.6	+ 77.1	69.03	14 50.4	54 21.9	
11	U	6 12.61	2.121	5 29 43.60	137.49	+26 51 57.5	− 23.0	68.97	14 48.9	54 16.4	I. S.
11	L	18 38.00	2.108	5 57 9.24	136.69	26 37 26.3	121.9	68.75	14 48.2	54 13.7	
12	U	7 3.17	2.086	6 24 22.03	135.37	26 3 22.1	218.3	68.39	14 48.2	54 13.8	I. N.
12	L	19 28.04	2.057	6 51 16.39	133.63	25 10 21.2	311.1	67.91	14 48.9	54 16.6	
13	U	7 52.53	2.023	7 17 48.05	131.60	+23 59 11.9	−399.5	67.35	14 50.4	54 22.1	I. N.
13	L	20 16.59	1.987	7 43 54.19	129.40	22 30 53.0	482.6	66.73	14 52.6	54 30.1	
14	U	8 40.21	1.950	8 9 33.62	127.18	20 46 31.1	559.9	66.10	14 55.4	54 40.4	I. N.
14	L	21 3.40	1.915	8 34 46.81	125.05	18 47 19.1	630.9	65.49	14 58.8	54 52.8	
15	U	9 26.18	1.883	8 59 35.65	123.13	+16 34 35.0	−695.2	64.94	15 2.7	55 7.1	I. N.
15	L	21 48.61	1.856	9 24 3.43	121.55	14 9 41.3	752.5	64.47	15 7.0	55 22.9	
16	U	10 10.76	1.837	9 48 14.55	120.38	11 34 4.4	802.3	64.11	15 11.6	55 39.9	I. N.
16	L	22 32.73	1.825	10 12 14.37	119.68	8 49 15.6	844.4	63.89	15 16.5	55 57.9	
17	U	10 54.61	1.823	10 36 9.10	119.53	+ 5 56 51.6	−878.2	63.82	15 21.6	56 16.5	I. N.
17	L	23 16.52	1.830	11 0 5.57	119.98	+ 2 58 35.7	903.0	63.92	15 26.7	56 35.3	
18	U	11 38.58	1.848	11 24 11.20	121.07	− 0 3 40.7	918.1	64.21	15 31.8	56 54.1	I. *N.* S.
19	L	0 0.93	1.877	11 48 33.82	122.81	3 7 57.3	922.7	64.68	15 36.8	57 12.4	
19	U	12 23.69	1.918	12 13 21.50	125.25	− 6 12 3.1	−916.1	65.34	15 41.6	57 30.0	II. S.
20	L	0 47.00	1.970	12 38 42.43	128.36	9 13 35.4	897.1	66.18	15 46.2	57 46.7	
20	U	13 11.00	2.032	13 4 44.58	132.11	12 9 59.4	864.5	67.19	15 50.4	58 2.2	II. S.
21	L	1 35.80	2.104	13 31 35.34	136.44	14 58 27.9	817.7	68.35	15 54.3	58 16.3	
21	U	14 1.52	2.184	13 59 21.01	141.23	−17 36 2.4	−755.5	69.61	15 57.7	58 28.9	II. S.
22	L	2 28.23	2.268	14 28 6.00	146.29	19 59 35.9	677.5	70.92	16 0.7	58 39.9	
22	U	14 55.95	2.352	14 57 52.09	151.37	22 5 57.9	583.5	72.22	16 3.3	58 49.3	II. S.
23	L	3 24.66	2.431	15 28 37.56	156.13	23 52 1.0	474.5	73.43	16 5.4	58 57.2	
23	U	15 54.26	2.499	16 0 16.54	160.22	−25 14 51.8	−351.9	74.46	16 7.1	59 3.6	II. S.
24	L	4 24.57	2.550	16 32 38.63	163.27	26 12 2.4	218.4	75.22	16 8.5	59 8.5	
24	U	16 55.36	2.578	17 5 29.51	164.97	26 41 43.0	− 77.5	75.65	16 9.4	59 11.9	II. S.
25	L	5 26.35	2.581	17 38 31.87	165.16	26 42 52.5	+ 66.0	75.71	16 10.0	59 14.0	
25	U	17 57.22	2.559	18 11 27.36	163.85	−26 15 25.0	+207.8	75.40	16 10.2	59 14.9	II. N. *S.*
26	L	6 27.68	2.515	18 43 58.62	161.16	25 20 10.0	343.3	74.76	16 10.1	59 14.5	
26	U	18 57.50	2.453	19 15 51.08	157.43	23 58 46.0	468.8	73.84	16 9.6	59 12.8	II. N.
27	L	7 26.50	2.380	19 46 54.24	153.02	22 13 30.8	581.4	72.73	16 8.8	59 9.8	
27	U	19 54.59	2.301	20 17 2.01	148.26	−20 7 9.4	+679.6	71.53	16 7.7	59 5.6	II. N.
28	L	8 21.72	2.222	20 46 12.66	143.53	17 42 41.8	762.4	70.31	16 6.2	59 0.0	
28	U	20 47.93	2.148	21 14 27.98	139.08	15 3 14.3	829.5	69.14	16 4.3	58 53.1	II. N.
29	L	9 13.30	2.082	21 41 52.51	135.10	12 11 52.6	881.6	68.08	16 2.0	58 44.6	
29	U	21 37.93	2.025	22 8 32.69	131.71	− 9 11 36.2	+918.8	67.15	15 59.2	58 34.6	II. N.
30	L	10 1.95	1.980	22 34 36.20	128.99	6 5 18.2	941.9	66.40	15 56.1	58 23.1	
30	U	22 25.50	1.947	23 0 11.28	126.97	− 2 55 43.2	951.7	65.83	15 52.6	58 10.2	II. N.
31	L	10 48.72	1.925	23 25 26.33	125.66	+ 0 14 32.5	948.8	65.45	15 48.7	57 55.8	
31	U	23 11.74	1.914	23 50 29.65	125.01	+ 3 23 0.4	+933.9	65.26	15 44.4	57 40.2	

Mar. 18, U Defective Illumination of *N.* 0′.17. **Mar. 25, U Defective Illumination of S. 0′.12.**

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Mar. 31	U	23 11.74	1.914	23 50 29.65	125.01	+ 3 23 0.4	+933.9	65.26	15 44.4	57 40.2	
Apr. 1	L	11 34.69	1.914	0 15 29.10	125.00	6 27 19.5	907.5	65.25	15 39.9	57 23.5	
1	U	23 57.71	1.923	0 40 31.94	125.57	9 25 15.6	870.1	65.39	15 35.1	57 5.9	
2	L	12 20.88	1.941	1 5 44.65	126.63	12 14 41.5	822.4	65.68	15 30.1	56 47.7	
3	U	0 44.31	1.965	1 31 12.64	128.09	+14 53 36.6	+765.1	66.09	15 25.1	56 29.2	
3	L	13 8.07	1.994	1 57 0.08	129.85	17 20 7.6	698.6	66.57	15 20.0	56 10.6	
4	U	1 32.19	2.026	2 23 9.76	131.77	19 32 29.6	623.7	67.10	15 15.0	55 52.3	I. S.
4	L	13 56.70	2.058	2 49 42.72	133.70	21 29 7.0	541.4	67.63	15 10.2	55 34.7	
5	U	2 21.59	2.088	3 16 38.20	135.49	+23 8 35.5	+452.4	68.14	15 5.7	55 18.2	I. S.
5	L	14 46.80	2.113	3 43 53.58	137.00	24 29 44.6	358.3	68.56	15 1.6	55 2.9	
6	U	3 12.28	2.131	4 11 24.52	138.07	25 31 38.9	260.3	68.88	14 57.9	54 49.3	I. S.
6	L	15 37.92	2.140	4 39 5.13	138.60	26 13 40.9	159.8	69.04	14 54.6	54 37.5	
7	U	4 3.60	2.139	5 6 48.51	138.53	+26 35 31.3	+ 58.6	69.06	14 52.0	54 27.9	I. S.
7	L	16 29.20	2.127	5 34 27.24	137.83	26 37 10.5	− 41.9	68.92	14 50.1	54 20.7	
8	U	4 54.61	2.106	6 1 54.14	136.56	26 18 56.2	140.0	68.61	14 48.8	54 16.0	I. S.
8	L	17 19.71	2.077	6 29 2.78	134.81	25 41 23.1	234.8	68.17	14 48.2	54 14.0	
9	U	5 44.43	2.041	6 55 47.97	132.08	+24 45 19.0	−325.1	67.62	14 48.4	54 14.7	I. N.
9	L	18 8.69	2.002	7 22 6.15	130.33	23 31 41.7	410.3	67.00	14 49.3	54 18.1	
10	U	6 32.48	1.962	7 47 55.53	127.91	22 1 37.0	489.6	66.35	14 51.0	54 24.3	I. N.
10	L	18 55.79	1.923	8 13 16.12	125.55	20 16 14.8	563.0	65.71	14 53.5	54 33.3	
11	U	7 18.64	1.887	8 38 9.51	123.39	+18 16 47.8	−630.4	65.11	14 56.7	54 45.0	I. N.
11	L	19 41.10	1.857	9 2 38.81	121.55	16 4 29.9	691.6	64.59	15 0.5	54 59.1	
12	U	8 3.22	1.833	9 26 48.36	120.12	13 40 36.8	746.3	64.17	15 5.0	55 15.5	I. N.
12	L	20 25.11	1.817	9 50 43.58	119.17	11 6 25.6	794.5	63.88	15 10.1	55 34.1	
13	U	8 46.87	1.810	10 14 30.79	118.79	+ 8 23 16.4	−835.9	63.74	15 15.6	55 54.4	I. N.
13	L	21 8.61	1.814	10 38 17.01	119.02	5 32 34.4	869.9	63.76	15 21.5	56 16.2	
14	U	9 30.46	1.829	11 2 9.90	119.91	+ 2 35 51.2	895.9	63.97	15 27.7	56 39.0	I. N.
14	L	21 52.56	1.856	11 26 17.64	121.50	− 0 25 11.1	913.0	64.38	15 34.2	57 2.5	
15	U	10 15.04	1.894	11 50 48.82	123.82	− 3 28 38.7	−919.9	64.98	15 40.6	57 26.1	I. N.
15	L	22 38.07	1.945	12 15 52.27	126.88	6 32 22.8	915.4	65.78	15 46.9	57 49.3	
16	U	11 1.77	2.008	12 41 36.82	130.67	9 33 57.6	898.1	66.77	15 53.0	58 11.7	I. N.*S*.
16	L	23 26.30	2.082	13 8 11.01	135.14	12 30 38.7	866.2	67.93	15 58.8	58 32.8	
17	U	11 51.79	2.167	13 35 42.54	140.21	−15 19 23.1	−818.3	69.23	16 4.0	58 52.0	I.*II.* S.
18	L	0 18.33	2.258	14 4 17.57	145.69	17 56 50.5	753.3	70.62	16 8.6	59 9.0	
18	U	12 45.99	2.352	14 33 59.75	151.35	20 19 27.8	670.0	72.04	16 12.5	59 23.3	II. S.
19	L	1 14.76	2.443	15 4 49.26	156.85	22 23 37.1	568.6	73.41	16 15.6	59 34.8	
19	U	13 44.58	2.525	15 36 41.79	161.77	−24 5 46.9	−450.3	74.63	16 18.0	59 43.3	II. S.
20	L	2 15.29	2.590	16 9 27.83	165.69	25 22 47.6	317.6	75.59	16 19.4	59 48.7	
20	U	14 46.65	2.632	16 42 52.72	168.19	26 12 7.7	174.4	76.22	16 20.1	59 51.0	II. S.
21	L	3 18.34	2.645	17 16 37.67	169.00	26 32 9.8	− 25.6	76.45	16 19.9	59 50.5	
21	U	15 50.02	2.629	17 50 21.65	168.03	−26 22 20.9	+123.3	76.25	16 19.0	59 47.2	II. S.
22	L	4 21.33	2.586	18 23 43.81	165.41	25 43 15.2	266.4	75.65	16 17.5	59 41.6	
22	U	16 51.98	2.520	18 56 26.07	161.44	24 36 28.7	399.4	74.73	16 15.4	59 34.0	II. N.
23	L	5 21.74	2.438	19 28 14.74	156.55	23 4 25.0	518.7	73.56	16 12.8	59 24.5	
23	U	17 50.47	2.349	19 59 1.44	151.18	−21 10 0.4	+622.6	72.25	16 9.9	59 13.7	II. N.

Apr. 16, U Defective Illumination of S. 0″.00. Apr. 17, U Defective Illumination of *II.* 0″.03.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
pr.23	U	17 50.47	2.349	19 59 1.44	151.18	−21 10 0.4	+622.6	72.25	16 9.9	59 13.7	II. N.
24	L	6 18.11	2.259	20 28 42.89	145.74	18 56 27.1	710.2	70.89	16 6.6	59 1.7	
24	U	18 44.69	2.172	20 57 20.24	140.55	16 27 0.9	781.5	69.56	16 3.1	58 48.8	II. N.
25	L	7 10.28	2.094	21 24 58.01	135.84	13 44 52.4	837.4	68.33	15 59.4	58 35.3	
25	U	19 34.99	2.026	21 51 43.02	131.78	−10 53 1.3	+878.8	67.25	15 55.6	58 21.2	II. N.
26	L	7 58.96	1.971	22 17 43.57	128.44	7 54 14.5	906.7	66.33	15 51.7	58 6.8	
26	U	20 22.34	1.928	22 43 8.66	125.87	4 51 6.9	922.4	65.62	15 47.7	57 52.1	II. N.
27	L	8 45.29	1.898	23 8 7.59	124.07	− 1 46 2.4	926.4	65.11	15 43.6	57 37.2	
27	U	21 7.96	1.881	23 32 49.50	123.03	+ 1 18 44.8	+919.6	64.79	15 39.5	57 22.1	II. N.
28	L	9 30.49	1.876	23 57 23.20	122.70	4 21 6.3	902.3	64.66	15 35.3	57 6.9	
28	U	21 53.02	1.881	0 21 56.96	123.03	7 18 59.7	874.9	64.72	15 31.1	56 51.5	II. N.
29	L	10 15.67	1.896	0 46 38.27	123.95	10 10 26.0	837.8	64.95	15 27.0	56 36.2	
29	U	22 38.56	1.920	1 11 33.75	125.37	+12 53 29.5	+791.1	65.31	15 22.8	56 20.8	II. N.
30	L	11 1.78	1.950	1 36 48.85	127.20	15 26 16.6	735.2	65.78	15 18.6	56 5.6	
30	U	23 25.39	1.985	2 2 27.70	129.31	17 46 57.0	670.1	66.32	15 14.5	55 50.6	
ay 1	L	11 49.44	2.023	2 28 32.76	131.54	19 53 45.4	596.5	66.91	15 10.5	55 35.9	
2	U	0 13.93	2.059	2 55 4.68	133.75	+21 45 3.1	+515.1	67.50	15 6.7	55 21.7	
2	L	12 38.85	2.092	3 22 2.04	135.75	23 19 21.3	426.8	68.03	15 3.0	55 8.1	
3	U	1 4.13	2.120	3 49 21.38	137.39	24 35 24.2	332.8	68.46	14 59.5	54 55.4	I. S.
3	L	13 29.69	2.138	4 16 57.32	138.50	25 32 12.4	234.6	68.77	14 56.3	54 43.8	
4	U	1 55.40	2.146	4 44 42.81	138.98	+26 9 6.3	+134.0	68.92	14 53.5	54 33.5	I. S.
4	L	14 21.14	2.142	5 12 29.80	138.75	26 25 47.3	+ 32.8	68.90	14 51.1	54 24.7	
5	U	2 46.77	2.127	5 40 9.89	137.82	26 22 19.2	− 67.2	68.70	14 49.2	54 17.5	I. S.
5	L	15 12.15	2.101	6 7 35.02	136.26	25 59 6.1	164.4	68.33	14 47.7	54 12.2	
6	U	3 37.16	2.067	6 34 38.20	134.19	+25 16 51.0	−257.3	67.82	14 46.9	54 9.1	I. N.
6	L	16 1.72	2.026	7 1 14.02	131.74	24 16 31.1	345.0	67.21	14 46.6	54 8.2	
7	U	4 25.77	1.982	7 27 18.99	129.08	22 59 14.1	426.7	66.54	14 47.0	54 9.7	I. N.
7	L	16 49.27	1.937	7 52 51.61	126.37	21 26 14.3	502.1	65.84	14 48.1	54 13.7	
8	U	5 12.25	1.894	8 17 52.32	123.77	+19 38 48.7	−571.0	65.16	14 49.9	54 20.3	I. N.
8	L	17 34.74	1.855	8 42 23.33	121.44	17 38 15.0	633.5	64.54	14 52.5	54 29.6	
9	U	5 56.79	1.822	9 6 28.36	119.47	15 25 49.2	689.7	64.00	14 55.7	54 41.6	I. N.
9	L	18 18.49	1.797	9 30 12.41	117.96	13 2 46.3	739.8	63.58	14 59.7	54 56.2	
10	U	6 39.95	1.781	9 53 41.52	116.99	+10 30 20.0	−783.6	63.31	15 4.4	55 13.3	I. N.
10	L	19 1.27	1.775	10 17 2.67	116.64	7 49 43.7	821.4	63.20	15 9.7	55 32.9	
11	U	7 22.59	1.780	10 40 23.54	116.96	5 2 13.2	852.6	63.27	15 15.7	55 54.7	I. N.
11	L	19 44.04	1.797	11 3 52.44	117.99	+ 2 9 9.1	876.9	63.54	15 22.2	56 18.5	
12	U	8 5.77	1.827	11 27 38.29	119.79	− 0 48 0.2	−893.3	64.01	15 29.1	56 43.9	I. N.
12	L	20 27.94	1.870	11 51 50.44	122.38	3 47 34.9	900.9	64.68	15 36.3	57 10.6	
13	U	8 50.71	1.927	12 16 38.66	125.79	6 47 40.6	898.2	65.58	15 43.8	57 38.0	I. N.
13	L	21 14.25	1.998	12 42 12.82	130.04	9 46 3.3	883.4	66.68	15 51.3	58 5.6	
14	U	9 38.71	2.081	13 8 42.64	135.06	−12 40 7.5	−854.7	67.97	15 58.8	58 32.9	I. N.
14	L	22 4.24	2.176	13 36 17.09	140.79	15 26 53.6	810.0	69.42	16 5.9	58 59.1	
15	U	10 30.97	2.280	14 5 3.62	147.04	18 2 57.9	747.4	70.98	16 12.6	59 23.5	I. N.*S*.
15	L	22 58.98	2.388	14 35 7.07	153.55	20 24 34.9	665.3	72.58	16 18.6	59 45.6	
16	U	11 28.28	2.494	15 6 28.31	159.94	−22 27 46.6	−563.2	74.12	16 23.8	60 4.6	I. S.

May 15, U Defective Illumination of *S*. 0″.17.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
May 16	U	11 28.28	2.494	15 6 28.31	159.94	−22 27 46.6	−563.2	74.12	16 23.8	60 4.6	I. S.
16	L	23 58.80	2.590	15 39 2.95	165.70	24 8 34.6	441.7	75.50	16 28.0	60 20.0	
17	U	12 30.37	2.667	16 12 40.38	170.30	25 23 19.3	303.2	76.59	16 31.1	60 31.3	II. S.
18	L	1 2.70	2.716	16 47 3.60	173.25	26 9 2.2	−152.2	77.30	16 33.0	60 38.4	
18	U	13 35.42	2.731	17 21 50.37	174.19	−26 23 48.0	+ 5.2	77.53	16 33.7	60 41.0	II. S.
19	L	2 8.11	2.712	17 56 35.67	173.01	26 6 59.2	162.3	77.28	16 33.2	60 39.3	
19	U	14 40.37	2.660	18 30 54.86	169.89	25 19 21.9	312.2	76.58	16 31.6	60 33.4	II. *N*. S.
20	L	3 11.85	2.583	19 4 26.83	165.23	24 2 57.0	449.4	75.51	16 29.0	60 23.8	
20	U	15 42.28	2.488	19 36 56.10	159.53	−22 20 42.7	+569.9	74.18	16 25.5	60 10.8	II. N.
21	L	4 11.52	2.385	20 8 13.70	153.36	20 16 13.1	671.8	72.70	16 21.2	59 55.1	
21	U	16 39.52	2.283	20 38 16.80	147.19	17 53 15.7	754.5	71.19	16 16.3	59 37.3	II. N.
22	L	5 6.33	2.186	21 7 7.60	141.37	15 15 36.8	819.0	69.73	16 11.0	59 17.8	
22	U	17 32.02	2.099	21 34 51.93	136.14	−12 26 48.8	+866.3	68.40	16 5.4	58 57.2	II. N.
23	L	5 56.75	2.025	22 1 38.03	131.68	9 30 5.5	898.5	67.24	15 59.6	58 36.0	
23	U	18 20.67	1.964	22 27 35.46	128.04	6 28 21.0	916.8	66.27	15 53.8	58 14.6	II. N.
24	L	6 43.95	1.918	22 52 54.34	125.25	3 24 9.6	923.1	65.51	15 48.0	57 53.4	
24	U	19 6.76	1.886	23 17 44.88	123.31	− 0 19 49.6	+918.4	64.97	15 42.3	57 32.5	II. N.
25	L	7 29.26	1.867	23 42 17.01	122.18	+ 2 42 33.8	903.9	64.64	15 36.8	57 12.3	
25	U	19 51.62	1.861	0 6 40.14	121.80	5 41 5.4	879.9	64.52	15 31.5	56 52.8	II. N.
26	L	8 13.97	1.866	0 31 3.04	122.12	8 33 56.8	847.2	64.57	15 26.4	56 34.2	
26	U	20 36.44	1.882	0 55 33.57	123.06	+11 19 24.0	+805.9	64.80	15 21.6	56 16.6	II. N.
27	L	8 59.16	1.906	1 20 18.68	124.54	13 55 45.5	756.2	65.17	15 17.1	55 59.9	
27	U	21 22.22	1.938	1 45 24.12	126.43	16 21 21.2	698.3	65.65	15 12.8	55 44.2	II. N.
28	L	9 45.68	1.974	2 10 54.14	128.61	18 34 32.6	632.3	66.20	15 8.8	55 29.4	
28	U	22 9.60	2.012	2 36 51.32	130.93	+20 33 43.3	+558.3	66.78	15 5.0	55 15.7	II. N.
29	L	10 33.98	2.050	3 3 16.31	133.22	22 17 22.0	477.0	67.36	15 1.5	55 2.9	
29	U	22 58.79	2.085	3 30 7.64	135.29	23 44 5.1	389.1	67.89	14 58.4	54 51.2	
30	L	11 23.99	2.113	3 57 21.66	136.96	24 52 39.5	295.7	68.31	14 55.5	54 40.5	
30	U	23 49.46	2.132	4 24 52.64	138.10	+25 42 7.7	+198.4	68.59	14 52.8	54 30.8	
31	L	12 15.10	2.139	4 52 33.24	138.55	26 11 51.6	+ 98.6	68.71	14 50.5	54 22.4	
June 1	U	0 40.75	2.135	5 20 14.99	138.28	26 21 33.5	− 1.6	68.64	14 48.5	54 15.1	
1	L	13 6.28	2.118	5 47 49.01	137.27	26 11 19.6	100.4	68.40	14 46.9	54 9.2	
2	U	1 31.53	2.090	6 15 6.85	135.60	+25 41 36.9	−196.1	67.99	14 45.7	54 4.8	I. S.
2	L	13 56.40	2.053	6 42 1.22	133.39	24 53 12.6	287.1	67.44	14 44.9	54 1.9	
3	U	2 20.78	2.010	7 8 26.47	130.77	23 47 9.2	372.4	66.79	14 44.6	54 0.7	I. N.
3	L	14 44.62	1.963	7 34 18.89	127.94	22 24 41.0	451.1	66.07	14 44.8	54 1.3	
4	U	3 7.89	1.915	7 59 36.96	125.07	+20 47 8.7	−523.0	65.34	14 45.5	54 3.9	I. N.
4	L	15 30.59	1.869	8 24 21.07	122.32	18 55 56.4	587.9	64.62	14 46.7	54 8.6	
5	U	3 52.76	1.827	8 48 33.48	119.81	16 52 28.3	645.7	63.96	14 48.6	54 15.5	I. N.
5	L	16 14.47	1.792	9 12 17.96	117.68	14 38 6.4	696.8	63.40	14 51.1	54 24.7	
6	U	4 35.80	1.764	9 35 39.58	116.01	+12 14 9.5	−741.5	62.97	14 54.3	54 36.3	I. N.
6	L	16 56.86	1.746	9 58 44.51	114.90	9 41 54.0	780.0	62.68	14 58.1	54 50.3	
7	U	5 17.75	1.738	10 21 39.75	114.41	7 2 34.3	812.3	62.56	15 2.6	55 6.8	I. N.
7	L	17 38.61	1.741	10 44 33.06	114.60	4 17 24.0	838.3	62.62	15 7.8	55 25.7	
8	U	5 59.58	1.756	11 7 32.89	115.51	+ 1 27 39.2	−858.0	62.88	15 13.6	55 47.0	I. N.

May 19, U Defective Illumination of *N*. 0″.01.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
June 8	U	5 59.58	1.756	11 7 32.89	115.51	+ 1 27 39.2	−858.0	62.88	15 13.6	55 47.0	I. N.
8	L	18 20.80	1.784	11 30 48.26	117.20	− 1 25 19.8	870.6	63.35	15 20.0	56 10.5	
9	U	6 42.45	1.826	11 54 28.70	119.69	4 20 3.9	875.3	64.03	15 26.9	56 35.9	I. N.
9	L	19 4.68	1.881	12 18 44.27	123.05	7 14 51.9	871.0	64.93	15 34.3	57 3.1	
10	U	7 27.66	1.952	12 43 45.31	127.27	−10 7 46.7	−856.2	66.05	15 42.1	57 31.6	I. N.
10	L	19 51.57	2.036	13 9 42.22	132.35	12 56 31.2	829.0	67.38	15 50.1	58 1.0	
11	U	8 16.58	2.134	13 36 44.98	138.23	15 38 23.6	787.2	68.88	15 58.2	58 30.8	I. N.
11	L	20 42.82	2.242	14 5 2.35	144.76	18 10 16.9	728.7	70.52	16 6.2	59 0.2	
12	U	9 10.42	2.358	14 34 40.99	151.72	−20 28 38.1	−651.5	72.22	16 13.9	59 28.5	I. N.
12	L	21 39.42	2.475	15 5 43.89	158.74	22 29 33.8	554.3	73.91	16 21.1	59 55.0	
13	U	10 9.78	2.584	15 38 8.94	165.32	24 8 59.9	436.7	75.47	16 27.6	60 18.9	I. N.*S.*
13	L	22 41.37	2.677	16 11 47.63	170.91	25 23 0.4	300.4	76.77	16 33.2	60 39.3	
14	U	11 13.92	2.743	16 46 24.31	174.90	−26 8 9.1	−148.9	77.69	16 37.7	60 55.7	I. S.
14	L	23 47.07	2.775	17 21 36.93	176.83	26 21 57.8	+ 11.9	78.13	16 40.9	61 7.3	
15	U	12 20.37	2.770	17 56 59.23	176.50	26 3 16.6	174.7	78.05	16 42.6	61 13.8	II. S.
16	L	0 53.39	2.728	18 32 4.05	173.96	25 12 26.3	332.1	77.47	16 43.0	61 15.0	
16	U	13 25.72	2.655	19 6 27.10	169.61	−23 51 16.1	+477.0	76.47	16 41.9	61 11.0	II. N. S.
17	L	1 57.04	2.562	19 39 49.62	163.98	22 2 47.8	604.4	75.16	16 39.4	61 1.9	
17	U	14 27.15	2.457	20 11 59.84	157.66	19 50 51.7	711.3	73.66	16 35.7	60 48.3	II. N.
18	L	2 55.99	2.349	20 42 52.95	151.20	17 19 41.9	796.7	72.10	16 30.9	60 30.6	
18	U	15 23.56	2.247	21 12 29.91	145.03	−14 33 34.8	+861.1	70.59	16 25.2	60 9.7	II. N.
19	L	3 49.95	2.154	21 40 56.01	139.44	11 36 33.4	906.1	69.20	16 18.8	59 46.3	
19	U	16 15.30	2.073	22 8 19.41	134.60	8 32 19.4	933.6	67.97	16 11.9	59 21.0	II. N.
20	L	4 39.77	2.007	22 34 49.85	130.62	5 24 9.3	945.7	66.94	16 4.7	58 54.5	
20	U	17 3.53	1.956	23 0 37.81	127.52	− 2 14 54.9	+944.6	66.13	15 57.3	58 27.6	II. N.
21	L	5 26.76	1.919	23 25 53.82	125.29	+ 0 52 54.6	931.8	65.55	15 50.0	58 0.8	
21	U	17 49.63	1.895	23 50 48.18	123.90	3 57 8.0	908.8	65.18	15 42.9	57 34.5	II. N.
22	L	6 12.31	1.885	0 15 30.59	123.29	6 55 49.8	876.7	65.01	15 36.0	57 9.1	
22	U	18 34.93	1.887	0 40 10.01	123.40	+ 9 47 14.8	+836.1	65.03	15 29.4	56 44.9	II. N.
23	L	6 57.64	1.899	1 4 54.51	124.13	12 29 45.7	787.7	65.21	15 23.2	56 22.2	
23	U	19 20.55	1.920	1 29 51.09	125.39	15 1 50.5	731.8	65.53	15 17.4	56 1.1	II. N.
24	L	7 43.75	1.948	1 55 5.51	127.07	17 22 0.0	668.6	65.96	15 12.1	55 41.6	
24	U	20 7.33	1.981	2 20 42.00	129.04	+19 28 47.8	+598.2	66.46	15 7.3	55 23.9	II. N.
25	L	8 31.31	2.016	2 46 43.19	131.16	21 20 50.9	521.2	66.99	15 3.0	55 8.0	
25	U	20 55.71	2.051	3 13 9.68	133.24	22 56 50.3	437.8	67.50	14 59.1	54 53.8	II. N.
26	L	9 20.51	2.082	3 40 0.01	135.11	24 15 33.7	348.6	67.95	14 55.7	54 41.3	
26	U	21 45.65	2.106	4 7 10.68	136.59	+25 15 59.0	+254.9	68.30	14 52.7	54 30.4	II. N.
27	L	10 11.03	2.122	4 34 36.16	137.55	25 57 18.1	157.8	68.52	14 50.2	54 21.1	
27	U	22 36.54	2.128	5 2 9.32	137.86	26 18 59.7	+ 59.0	68.58	14 48.1	54 13.4	II. S.
28	L	11 2.05	2.121	5 29 42.05	137.47	26 20 52.8	− 40.1	68.45	14 46.3	54 7.1	
28	U	23 27.41	2.103	5 57 5.89	136.38	+26 3 6.7	−137.3	68.16	14 45.0	54 2.3	
29	L	11 52.48	2.074	6 24 12.76	134.66	25 26 12.1	231.1	67.71	14 44.1	53 58.9	
30	U	0 17.16	2.037	6 50 55.73	132.42	24 30 58.2	320.2	67.12	14 43.6	53 57.0	
30	L	12 41.35	1.994	7 17 9.37	129.81	23 18 29.8	403.4	66.44	14 43.5	53 56.5	
July 1	U	1 4.99	1.947	7 42 50.24	126.99	+21 50 3.3	−479.8	65.70	14 43.7	53 57.4	I. N.

June 13, U Defective Illumination of *S.* 0″.04.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
July 1	U	1 4.99	1.947	7 42 50.24	126.99	+21 50 3.3	−479.8	65.70	14 43.7	53 57.4	I. N.
1	L	13 28.07	1.899	8 7 56.78	124.12	20 7 2.5	549.0	64.95	14 44.4	53 59.8	
2	U	1 50.58	1.853	8 32 29.44	121.36	18 10 55.3	610.9	64.23	14 45.5	54 3.8	I. N.
2	L	14 12.56	1.811	8 56 30.29	118.84	16 3 10.8	665.3	63.56	14 47.0	54 9.5	
3	U	2 34.07	1.775	9 20 2.94	116.67	+13 45 15.6	−712.6	62.99	14 49.0	54 16.9	I. N.
3	L	14 55.20	1.747	9 43 12.23	114.96	11 18 35.1	753.0	62.55	14 51.5	54 26.1	
4	U	3 16.04	1.727	10 6 3.98	113.76	8 44 31.0	786.6	62.25	14 54.6	54 37.3	I. N.
4	L	15 36.69	1.717	10 28 44.88	113.15	6 4 23.2	813.6	62.10	14 58.1	54 50.3	
5	U	3 57.29	1.718	10 51 22.33	113.20	+ 3 19 29.7	−834.2	62.14	15 2.2	55 5.4	I. N.
5	L	16 17.96	1.730	11 14 4.35	113.93	+ 0 31 9.6	848.0	62.37	15 6.9	55 22.6	
6	U	4 38.85	1.754	11 36 59.52	115.40	− 2 19 15.8	854.9	62.81	15 12.2	55 41.9	I. N.
6	L	17 0.11	1.791	12 0 16.96	117.65	5 10 19.4	854.3	63.46	15 18.0	56 3.2	
7	U	5 21.90	1.842	12 24 6.23	120.71	− 8 0 25.9	−845.3	64.31	15 24.3	56 26.4	I. N.
7	L	17 44.38	1.907	12 48 37.24	124.60	10 47 47.2	826.6	65.38	15 31.1	56 51.4	
8	U	6 7.73	1.986	13 13 59.97	129.33	13 30 19.7	796.8	66.64	15 38.3	57 17.9	I. N.
8	L	18 32.09	2.077	13 40 24.20	134.84	16 5 40.0	754.3	68.09	15 45.9	57 45.7	
9	U	6 57.63	2.180	14 7 58.85	141.04	−18 31 3.1	−697.0	69.68	15 53.7	58 14.3	I. N.
9	L	19 24.45	2.292	14 36 51.10	147.74	20 43 20.4	623.0	71.35	16 1.6	58 43.3	
10	U	7 52.64	2.406	15 7 5.21	154.62	22 39 3.4	531.0	73.03	16 9.4	59 12.0	I. N.
10	L	20 22.19	2.517	15 38 41.14	161.29	24 14 29.7	420.2	74.63	16 17.0	59 39.7	
11	U	8 53.00	2.616	16 11 33.28	167.23	−25 25 55.8	−291.3	76.02	16 24.1	60 5.7	I. N.
11	L	21 24.88	2.693	16 45 29.46	171.88	26 9 57.6	−146.7	77.08	16 30.4	60 29.1	
12	U	9 57.51	2.741	17 20 11.16	174.75	26 23 52.1	+ 9.0	77.72	16 35.9	60 49.2	I. *N*.S.
12	L	22 30.52	2.754	17 55 14.95	175.53	26 6 1.7	169.7	77.88	16 40.3	61 5.1	
13	U	11 3.46	2.731	18 30 15.24	174.18	−25 16 9.9	+328.0	77.54	16 43.3	61 16.3	I. S.
13	L	23 35.94	2.677	19 4 47.64	170.93	23 55 27.0	477.0	76.77	16 44.9	61 22.3	
14	U	12 7.62	2.599	19 38 31.93	166.24	22 6 22.1	610.8	75.66	16 45.1	61 22.9	*I*. II. *N*.S.
15	L	0 38.26	2.507	20 11 13.99	160.66	19 52 25.2	725.2	74.32	16 43.7	61 17.9	
15	U	13 7.75	2.408	20 42 46.34	154.71	−17 17 44.5	+817.9	72.89	16 41.0	61 7.7	II. N.
16	L	1 36.05	2.310	21 13 7.40	148.85	14 26 44.0	888.5	71.46	16 36.9	60 52.7	
16	U	14 3.23	2.220	21 42 20.45	143.42	11 23 44.6	937.9	70.12	16 31.6	60 33.3	II. N.
17	L	2 29.38	2.140	22 10 32.01	138.63	8 12 52.7	967.6	68.92	16 25.3	60 10.3	
17	U	14 54.65	2.074	22 37 50.71	134.62	− 4 57 52.6	+979.6	67.91	16 18.3	59 44.5	II. N.
18	L	3 19.20	2.021	23 4 26.20	131.43	− 1 42 2.9	976.2	67.10	16 10.7	59 16.7	
18	U	15 43.20	1.982	23 30 28.51	129.09	+ 1 31 42.7	959.3	66.51	16 2.8	58 47.7	II. N.
19	L	4 6.82	1.956	23 56 7.50	127.54	4 40 52.8	930.6	66.12	15 54.7	58 18.1	
19	U	16 30.20	1.943	0 21 32.53	126.75	+ 7 43 16.0	+891.6	65.93	15 46.7	57 48.7	II. N.
20	L	4 53.49	1.941	0 46 52.22	126.64	10 36 57.1	843.7	65.92	15 38.9	57 20.0	
20	U	17 16.82	1.949	1 12 14.33	127.13	13 20 13.0	787.6	66.06	15 31.4	56 52.4	II. N.
21	L	5 40.31	1.966	1 37 45.41	128.12	15 51 30.6	724.1	66.34	15 24.3	56 26.3	
21	U	18 4.03	1.988	2 3 30.80	129.49	+18 9 24.5	+653.8	66.70	15 17.7	56 2.1	II. N.
22	L	6 28.05	2.015	2 29 34.27	131.11	20 12 35.4	577.0	67.12	15 11.6	55 39.9	
22	U	18 52.40	2.044	2 55 57.94	132.83	21 59 49.6	494.4	67.56	15 6.2	55 19.9	II. N.
23	L	7 17.10	2.071	3 22 42.01	134.48	23 30 0.7	406.6	67.97	15 1.4	55 2.2	
23	U	19 42.10	2.095	3 49 44.76	135.92	+24 42 10.5	+314.4	68.32	14 57.1	54 46.7	II. N.

July 12, U Defective **Illumination of** ***N*****. 0″.32.**
July 14, U Defective **Illumination of** ***I*****. 0″.00.**

July 14, U Defective Illumination of *N*. 0″.20.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
July 23	U	19 42.10	2.095	3 49 44.76	135.92	+24 42 10.5	+314.4	68.32	14 57.1	54 46.7	II. N.
24	L	8 7.36	2.113	4 17 2.61	136.98	25 35 31.2	218.7	68.56	14 53.5	54 33.5	
24	U	20 32.78	2.122	4 44 30.21	137.53	26 9 28.9	120.7	68.67	14 50.5	54 22.5	II. N.
25	L	8 58.25	2.121	5 12 0.99	137.49	26 23 45.6	+ 22.0	68.62	14 48.1	54 13.7	
25	U	21 23.65	2.110	5 39 27.53	136.83	+26 18 20.4	− 76.0	68.42	14 46.3	54 6.9	II. S.
26	L	9 48.86	2.089	6 6 42.34	135.55	25 53 31.4	171.7	68.05	14 45.0	54 2.1	
26	U	22 13.76	2.059	6 33 38.43	133.72	25 9 54.1	263.8	67.54	14 44.1	53 59.0	II. S.
27	L	10 38.24	2.021	7 0 9.86	131.45	24 8 20.4	350.9	66.92	14 43.8	53 57.7	
27	U	23 2.24	1.979	7 26 12.23	128.90	+22 49 56.1	−432.1	66.22	14 43.9	53 58.1	II. S.
28	L	11 25.72	1.933	7 51 42.77	126.18	21 15 56.8	506.7	65.48	14 44.4	53 59.9	
28	U	23 48.65	1.888	8 16 40.57	123.47	19 27 45.6	574.0	64.74	14 45.3	54 3.1	
29	L	12 11.04	1.845	8 41 6.31	120.86	17 26 49.8	634.0	64.03	14 46.5	54 7.8	
30	U	0 32.94	1.806	9 5 2.26	118.51	+15 14 38.8	−686.5	63.39	14 48.2	54 13.8	
30	L	12 54.41	1.773	9 28 31.93	116.50	12 52 42.3	731.6	62.84	14 50.1	54 21.0	
31	U	1 15.51	1.746	9 51 39.97	114.92	10 22 28.4	769.4	62.42	14 52.5	54 29.6	I. N.
31	L	13 36.35	1.728	10 14 31.89	113.83	7 45 24.8	799.9	62.14	14 55.2	54 39.5	
Aug. 1	U	1 57.02	1.719	10 37 13.98	113.28	+ 5 2 57.4	−823.3	62.01	14 58.2	54 50.7	I. N.
1	L	14 17.65	1.720	10 59 53.12	113.34	+ 2 16 32.0	839.6	62.05	15 1.7	55 3.3	
2	U	2 38.35	1.732	11 22 36.75	114.04	− 0 32 24.5	848.6	62.28	15 5.4	55 17.2	I. N.
2	L	14 59.25	1.755	11 45 32.82	115.42	3 22 23.5	850.0	62.69	15 9.6	55 32.6	
3	U	3 20.50	1.789	12 8 49.62	117.50	− 6 11 51.4	−843.3	63.31	15 14.2	55 49.4	I. N.
3	L	15 42.24	1.836	12 32 35.84	120.33	8 59 8.2	827.9	64.11	15 19.2	56 7.7	
4	U	4 4.62	1.895	12 57 0.37	123.90	11 42 25.1	803.1	65.11	15 24.6	56 27.4	I. N.
4	L	16 27.78	1.967	13 22 12.09	128.18	14 19 40.8	767.6	66.29	15 30.3	56 48.5	
5	U	4 51.87	2.050	13 48 19.51	133.16	−16 48 39.8	−720.1	67.62	15 36.4	57 10.9	I. N.
5	L	17 17.01	2.142	14 15 30.28	138.72	19 6 50.6	659.4	69.08	15 42.8	57 34.3	
6	U	5 43.30	2.241	14 43 50.46	144.69	21 11 25.5	583.9	70.61	15 49.4	57 58.7	I. N.
6	L	18 10.80	2.343	15 13 23.60	150.83	22 59 22.2	492.8	72.15	15 56.2	58 23.6	
7	U	6 39.52	2.442	15 44 9.60	156.78	−24 27 29.8	−385.8	73.61	16 3.1	58 48.6	I. N.
7	L	19 9.37	2.531	16 16 3.82	162.12	25 32 38.5	263.2	74.88	16 9.8	59 13.3	
8	U	7 40.19	2.602	16 48 56.36	166.42	26 11 53.2	−127.3	75.89	16 16.3	59 37.0	I. N.
8	L	20 11.73	2.650	17 22 32.24	169.29	26 22 51.4	+ 18.9	76.53	16 22.3	59 59.1	
9	U	8 43.68	2.669	17 56 32.32	170.44	−26 4 1.2	+170.0	76.77	16 27.7	60 19.0	I. *N*.S.
9	L	21 15.67	2.659	18 30 35.46	169.80	25 14 54.3	320.6	76.59	16 32.3	60 35.8	
10	U	9 47.37	2.621	19 4 20.98	167.53	23 56 13.0	464.7	76.02	16 35.9	60 49.1	I. S.
10	L	22 18.48	2.561	19 37 31.08	163.96	22 9 48.4	597.0	75.14	16 38.4	60 58.3	
11	U	10 48.79	2.487	20 9 52.55	159.51	−19 58 29.2	+713.2	74.04	16 39.6	61 2.8	I. S.
11	L	23 18.15	2.406	20 41 17.51	154.62	17 25 47.2	810.4	72.84	16 39.5	61 2.4	
12	U	11 46.53	2.324	21 11 43.16	149.69	14 35 39.2	887.4	71.62	16 38.1	60 57.1	I. *N*.S.
13	L	0 13.95	2.247	21 41 11.08	145.04	11 32 11.8	943.7	70.45	16 35.3	60 46.9	
13	U	12 40.49	2.178	22 9 46.06	140.89	− 8 19 29.6	+980.0	69.40	16 31.3	60 32.2	II. N.
14	L	1 6.26	2.120	22 37 35.06	137.40	5 1 25.6	997.6	68.52	16 26.2	60 13.4	
14	U	13 31.41	2.073	23 4 46.27	134.61	− 1 41 35.3	998.0	67.81	16 20.1	59 51.1	II. N.
15	L	1 56.07	2.039	23 31 28.45	132.55	+ 1 36 45.0	982.9	67.30	16 13.3	59 26.0	
15	U	14 20.40	2.017	23 57 50.42	131.22	+ 4 50 39.8	+954.1	66.98	16 5.9	58 58.9	II. N.

Aug. 9, U Defective Illumination of *N*. 0″.56.   Aug. 12, U Defective Illumination of N. 0″.01.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Aug. 15	U	14 20.40	2.017	23 57 50.42	131.22	+ 4 50 39.8	+954.1	66.98	16 5.9	58 58.9	II. N.
16	L	2 44.53	2.006	0 24 0.51	130.57	7 57 33.6	913.0	66.83	15 58.1	58 30.4	
16	U	15 8.59	2.005	0 50 6.49	130.51	10 55 9.1	861.1	66.85	15 50.2	58 1.3	II. N.
17	L	3 32.70	2.013	1 16 15.10	131.00	13 41 25.0	800.0	67.01	15 42.3	57 32.3	
17	U	15 56.94	2.028	1 42 32.02	131.89	+16 14 34.7	+730.4	67.27	15 34.5	57 3.9	II. N.
18	L	4 21.40	2.048	2 9 1.48	133.06	18 33 4.1	653.4	67.60	15 27.1	56 36.6	
18	U	16 46.10	2.070	2 35 46.21	134.40	20 35 30.4	570.0	67.97	15 20.1	56 11.0	II. N.
19	L	5 11.08	2.092	3 2 47.19	135.75	22 20 42.2	481.1	68.34	15 13.7	55 47.3	
19	U	17 36.31	2.113	3 30 3.66	136.96	+23 47 39.3	+387.8	68.66	15 7.8	55 25.8	II. N.
20	L	6 1.76	2.128	3 57 32.96	137.87	24 55 33.9	290.9	68.89	15 2.6	55 6.7	
20	U	18 27.35	2.136	4 25 10.91	138.38	25 43 52.4	191.9	69.01	14 58.0	54 50.0	II. N.
21	L	6 52.99	2.136	4 52 51.94	138.38	26 12 16.0	+ 92.0	68.99	14 54.2	54 36.0	
21	U	19 18.58	2.127	5 20 29.64	137.82	+26 20 41.9	− 7.5	68.83	14 51.1	54 24.6	II. N.
22	L	7 44.00	2.108	5 47 57.24	136.70	26 9 24.0	105.1	68.51	14 48.7	54 15.8	
22	U	20 9.15	2.081	6 15 8.28	135.06	25 38 52.1	199.6	68.06	14 47.0	54 9.5	II. S.
23	L	8 33.92	2.047	6 41 57.04	133.00	24 49 50.8	289.8	67.48	14 45.9	54 5.5	
23	U	20 58.25	2.007	7 8 19.06	130.62	+23 43 17.3	−374.8	66.82	14 45.5	54 3.9	II. S.
24	L	9 22.08	1.965	7 34 11.28	128.06	22 20 18.5	453.9	66.10	14 45.6	54 4.4	
24	U	21 45.40	1.921	7 59 32.26	125.45	20 42 9.3	526.5	65.37	14 46.3	54 6.8	II. S.
25	L	10 8.19	1.879	8 24 22.14	122.90	18 50 9.8	592.2	64.64	14 47.4	54 11.1	
25	U	22 30.50	1.840	8 48 42.47	120.53	+16 45 43.6	−650.9	63.97	14 49.0	54 17.0	II. S.
26	L	10 52.36	1.805	9 12 36.08	118.46	14 30 16.2	702.5	63.38	14 51.0	54 24.3	
26	U	23 13.85	1.777	9 36 6.91	116.75	12 5 14.3	746.7	62.89	14 53.4	54 33.0	
27	L	11 35.03	1.756	9 59 19.73	115.47	9 32 5.5	783.5	62.52	14 56.1	54 42.8	
27	U	23 56.01	1.742	10 22 20.09	114.68	+ 6 52 18.4	−813.1	62.29	14 59.0	54 53.6	
28	L	12 16.88	1.738	10 45 14.16	114.43	4 7 22.5	835.0	62.22	15 2.2	55 5.4	
29	U	0 37.76	1.743	11 8 8.59	114.74	+ 1 18 49.8	849.2	62.32	15 5.7	55 18.0	
29	L	12 58.76	1.759	11 31 10.44	115.67	− 1 31 45.0	855.2	62.59	15 9.3	55 31.3	
30	U	1 20.01	1.785	11 54 27.10	117.22	− 4 22 42.7	−852.8	63.04	15 13.1	55 45.3	I. N.
30	L	13 41.63	1.821	12 18 6.25	119.42	7 12 18.6	841.5	63.67	15 17.1	56 0.0	
31	U	2 3.76	1.868	12 42 15.71	122.27	9 58 40.9	820.5	64.48	15 21.3	56 15.3	I. N.
31	L	14 26.52	1.926	13 7 3.24	125.76	12 39 49.5	789.1	65.45	15 25.6	56 31.1	
Sept. 1	U	2 50.03	1.994	13 32 36.33	129.85	−15 13 34.5	−746.4	66.58	15 30.1	56 47.6	I. N.
1	L	15 14.42	2.071	13 59 1.78	134.48	17 37 35.2	691.6	67.82	15 34.7	57 4.5	
2	U	3 39.77	2.155	14 26 25.21	139.49	19 49 20.6	623.8	69.16	15 39.5	57 22.0	I. N.
2	L	16 6.14	2.242	14 54 50.40	144.73	21 46 10.3	542.2	70.51	15 44.3	57 39.9	
3	U	4 33.57	2.328	15 24 18.51	149.93	−23 25 18.5	−446.8	71.84	15 49.3	57 58.1	I. N.
3	L	17 2.00	2.409	15 54 47.31	154.79	24 43 59.9	337.9	73.06	15 54.3	58 16.6	
4	U	5 31.34	2.478	16 26 10.71	158.96	25 39 38.9	216.7	74.09	15 59.4	58 35.0	I. N.
4	L	18 1.41	2.531	16 58 18.43	162.13	26 10 0.3	− 85.4	74.85	16 4.3	58 53.0	
5	U	6 31.99	2.562	17 30 56.64	164.01	−26 13 22.9	+ 52.6	75.29	16 9.0	59 10.5	I. N.*S.*
5	L	19 2.81	2.570	18 3 49.02	164.48	25 48 49.0	193.2	75.39	16 13.5	59 27.0	
6	U	7 33.58	2.554	18 36 38.44	163.54	24 56 13.3	332.1	75.14	16 17.6	59 42.0	I. S.
6	L	20 4.03	2.518	19 9 8.86	161.35	23 36 24.5	464.7	74.59	16 21.2	59 55.2	
7	U	8 33.95	2.466	19 41 7.02	158.21	−21 51 2.8	+587.0	73.79	16 24.1	60 6.0	I. S.

Sept. 5, U Defective Illumination of *S.* 0″.64.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
ept. 7	U	8 33.95	2.466	19 41 7.02	158.21	−21 51 2.8	+587.0	73.79	16 24.1	60 6.0	I. S.
7	L	21 3.17	2.403	20 12 23.41	154.45	19 42 31.0	695.8	72.84	16 26.3	60 14.0	
8	U	9 31.61	2.336	20 42 52.74	150.42	17 13 45.0	789.0	71.81	16 27.6	60 18.8	I. S.
8	L	21 59.24	2.270	21 12 33.66	146.43	14 28 3.2	865.0	70.79	16 28.0	60 20.1	
9	U	10 26.11	2.208	21 41 28.21	142.73	−11 28 55.4	+923.2	69.83	16 27.3	60 17.6	I. S.
9	L	22 52.28	2.155	22 9 40.95	139.49	8 19 56.2	963.6	68.98	16 25.6	60 11.3	
10	U	11 17.86	2.110	22 37 18.22	136.83	5 4 37.6	986.6	68.27	16 22.8	60 1.2	I. *N.* S.
10	L	23 42.97	2.077	23 4 27.38	134.81	− 1 46 24.5	992.8	67.75	16 19.1	59 47.5	
11	U	12 7.74	2.054	23 31 16.30	133.45	+ 1 31 27.6	+983.3	67.40	16 14.5	59 30.5	*I.* II. N.
12	L	0 32.31	2.042	23 57 52.79	132.74	4 45 55.6	959.0	67.21	16 9.0	59 10.5	
12	U	12 56.80	2.040	0 24 24.31	132.62	7 54 9.5	921.2	67.19	16 2.9	58 48.2	II. N.
13	L	1 21.32	2.047	0 50 57.61	133.02	10 53 33.4	870.9	67.32	15 56.3	58 23.9	
13	U	13 45.96	2.061	1 17 38.45	133.85	+13 41 45.6	+809.3	67.57	15 49.4	57 58.5	II. N.
14	L	2 10.80	2.080	1 44 31.29	135.00	16 16 39.0	737.9	67.90	15 42.3	57 32.4	
14	U	14 35.89	2.102	2 11 39.17	136.33	18 36 21.2	657.8	68.28	15 35.2	57 6.3	II. N.
15	L	3 1.25	2.125	2 39 3.30	137.69	20 39 15.4	570.1	68.66	15 28.2	56 40.7	
15	U	15 26.88	2.145	3 6 43.17	138.92	+22 24 0.6	+476.5	69.01	15 21.5	56 16.2	II. N.
16	L	3 52.72	2.161	3 34 36.38	139.88	23 49 32.8	378.2	69.29	15 15.2	55 53.0	
16	U	16 18.72	2.170	4 2 38.81	140.44	24 55 5.9	277.0	69.46	15 9.4	55 31.7	II. N.
17	L	4 44.78	2.171	4 30 44.87	140.48	25 40 13.1	174.2	69.49	15 4.2	55 12.6	
17	U	17 10.79	2.162	4 58 48.02	139.95	+26 4 46.8	+ 71.6	69.37	14 59.6	54 55.8	II. N.
18	L	5 36.63	2.144	5 26 41.29	138.84	26 8 58.3	− 29.3	69.09	14 55.7	54 41.6	
18	U	18 2.20	2.116	5 54 17.95	137.19	25 53 15.7	127.2	68.66	14 52.6	54 30.1	II. N.
19	L	6 27.40	2.081	6 21 31.99	135.09	25 18 23.0	220.8	68.11	14 50.2	54 21.3	
19	U	18 52.14	2.041	6 48 18.62	132.64	+24 25 17.0	−309.3	67.46	14 48.6	54 15.3	II. S.
20	L	7 16.36	1.997	7 14 34.55	129.99	23 15 3.2	391.9	66.74	14 47.7	54 12.0	
20	U	19 40.05	1.952	7 40 18.11	127.27	21 48 54.1	468.4	65.98	14 47.5	54 11.4	II. S.
21	L	8 3.21	1.907	8 5 29.31	124.61	20 8 6.0	538.5	65.23	14 48.0	54 13.3	
21	U	20 25.84	1.866	8 30 9.58	122.14	+18 13 57.4	−601.9	64.53	14 49.2	54 17.6	II. S.
22	L	8 48.01	1.830	8 54 21.67	119.93	16 7 47.4	658.7	63.89	14 51.0	54 24.1	
22	U	21 9.78	1.799	9 18 9.45	118.10	13 50 55.9	708.8	63.35	14 53.3	54 32.7	II. S.
23	L	9 31.22	1.776	9 41 37.69	116.69	11 24 43.1	752.2	62.93	14 56.2	54 43.1	
23	U	21 52.43	1.760	10 4 51.87	115.76	+ 8 50 30.5	−788.8	62.63	14 59.4	54 55.0	II. S.
24	L	10 13.50	1.754	10 27 58.09	115.37	6 9 41.4	818.2	62.49	15 3.0	55 8.3	
24	U	22 34.55	1.756	10 51 2.89	115.53	3 23 42.8	840.3	62.52	15 7.0	55 22.7	II. S.
25	L	10 55.70	1.769	11 14 13.22	116.29	+ 0 34 6.4	854.5	62.71	15 11.1	55 37.9	
25	U	23 17.05	1.792	11 37 36.32	117.66	− 2 17 30.1	−860.2	63.07	15 15.4	55 53.7	
26	L	11 38.74	1.825	12 1 19.65	119.67	5 9 21.3	856.8	63.61	15 19.8	56 9.8	
27	U	0 0.90	1.869	12 25 30.76	122.30	7 59 32.3	843.3	64.33	15 24.2	56 26.0	
27	L	12 23.64	1.923	12 50 17.13	125.53	10 45 58.3	819.1	65.21	15 28.6	56 42.1	
28	U	0 47.08	1.986	13 15 45.88	129.35	−13 26 23.9	−783.1	66.24	15 32.9	56 57.9	
28	L	13 11.33	2.058	13 42 3.50	133.67	15 58 22.3	734.4	67.39	15 37.1	57 13.4	
29	U	1 36.49	2.136	14 9 15.29	138.36	18 19 16.4	672.3	68.64	15 41.2	57 28.3	I. N.
29	L	14 2.61	2.217	14 37 24.79	143.25	20 26 21.8	596.2	69.92	15 45.1	57 42.7	
30	U	2 29.70	2.298	15 6 33.10	148.11	−22 16 50.1	−506.1	71.17	15 48.8	57 56.3	I. N.

Sept. 10, U Defective Illumination of *N.* 0″.08. **Sept. 11, U Defective Illumination of I. & II.**

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limb.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Sept. 30	U	2 29.70	2.298	15 6 33.10	148.11	−22 16 50.1	−506.1	71.17	15 48.8	57 56.3	I. N.
30	L	14 57.74	2.374	15 36 38.20	152.66	23 47 55.8	402.6	72.33	15 52.3	58 9.3	
Oct. 1	U	3 26.62	2.439	16 7 34.45	156.58	24 57 5.1	287.0	73.33	15 55.7	58 21.5	I. N.
1	L	15 56.20	2.488	16 39 12.44	159.57	25 42 5.2	161.6	74.08	15 58.8	58 33.0	
2	U	4 26.27	2.518	17 11 19.41	161.38	−26 1 16.0	− 29.4	74.54	16 1.7	58 43.6	I. N.
2	L	16 56.56	2.527	17 43 40.24	161.87	25 53 38.4	+105.8	74.68	16 4.4	58 53.5	
3	U	5 26.82	2.513	18 15 58.92	161.04	25 19 1.1	239.9	74.49	16 6.8	59 2.4	I. S.
3	L	17 56.79	2.479	18 48 0.33	159.02	24 18 0.3	369.0	74.01	16 9.0	59 10.3	
4	U	6 26.26	2.430	19 19 31.69	156.07	−22 51 57.5	+489.7	73.28	16 10.8	59 17.1	I. S.
4	L	18 55.07	2.371	19 50 23.63	152.50	21 2 51.1	599.2	72.40	16 12.3	59 22.6	
5	U	7 23.14	2.307	20 20 30.68	148.65	18 53 7.4	695.7	71.42	16 13.4	59 26.7	I. S.
5	L	19 50.44	2.243	20 49 51.09	144.78	16 25 31.7	777.8	70.42	16 14.1	59 29.0	
6	U	8 16.98	2.182	21 18 26.38	141.16	−13 42 59.9	+845.0	69.47	16 14.2	59 29.5	I. S.
6	L	20 42.84	2.129	21 46 20.67	137.97	10 48 32.7	897.0	68.62	16 13.8	59 28.0	
7	U	9 8.12	2.086	22 13 39.90	135.33	7 45 11.8	934.0	67.91	16 12.8	59 24.2	I. S.
7	L	21 32.94	2.052	22 40 31.20	133.33	4 35 56.8	956.0	67.35	16 11.1	59 18.1	
8	U	9 57.42	2.030	23 7 2.39	131.98	− 1 23 43.7	+963.7	66.97	16 8.8	59 9.5	I. S.
8	L	22 21.70	2.019	23 33 21.44	131.31	+ 1 48 35.4	957.1	66.77	16 5.8	58 58.6	
9	U	10 45.91	2.018	23 59 36.14	131.26	4 58 13.3	936.8	66.74	16 2.2	58 45.4	I. *N*.S.
9	L	23 10.17	2.027	0 25 53.82	131.78	8 2 28.6	903.4	66.86	15 58.0	58 29.9	
10	U	11 34.58	2.044	0 52 20.93	132.80	+10 58 46.5	+857.4	67.12	15 53.3	58 12.6	I. N
10	L	23 59.24	2.067	1 19 2.84	134.22	13 44 39.8	799.5	67.49	15 48.1	57 53.6	
11	U	12 24.21	2.095	1 46 3.48	135.91	16 17 50.2	730.5	67.94	15 42.5	57 33.3	II. N.
12	L	0 49.53	2.125	2 13 25.11	137.69	18 36 11.7	651.5	68.42	15 36.8	57 12.1	
12	U	13 15.20	2.153	2 41 7.99	139.42	+20 37 51.7	+563.8	68.88	15 30.9	56 50.6	II. N.
13	L	1 41.20	2.178	3 9 10.31	140.91	22 21 14.6	468.9	69.29	15 25.0	56 29.0	
13	U	14 7.45	2.196	3 37 28.19	141.99	23 45 4.7	368.6	69.59	15 19.2	56 7.8	II. N.
14	L	2 33.87	2.205	4 5 55.81	142.51	24 48 27.8	264.9	69.76	15 13.7	55 47.6	
14	U	15 0.33	2.203	4 34 25.94	142.39	+25 30 54.2	+159.5	69.77	15 8.5	55 28.6	II. N.
15	L	3 26.69	2.189	5 2 50.48	141.58	25 52 18.4	+ 54.8	69.60	15 3.8	55 11.2	
15	U	15 52.83	2.165	5 31 1.17	140.10	25 52 58.3	− 47.6	69.25	14 59.6	54 55.8	II. N.
16	L	4 18.61	2.130	5 58 50.40	138.02	25 33 32.4	145.9	68.75	14 56.0	54 42.5	
16	U	16 43.92	2.088	6 26 11.76	135.47	+24 54 56.5	−239.1	68.11	14 53.0	54 31.6	II. *N*.S.
17	L	5 8.70	2.040	6 53 0.52	132.61	23 58 19.2	326.1	67.39	14 50.8	54 23.4	
17	U	17 32.88	1.990	7 19 13.84	129.59	22 44 57.3	406.5	66.60	14 49.3	54 17.8	II. S.
18	L	5 56.46	1.940	7 44 50.81	126.58	21 16 11.9	480.0	65.80	14 48.5	54 15.0	
18	U	18 19.45	1.892	8 9 52.33	123.71	+19 33 25.2	−546.7	65.02	14 48.5	54 15.1	II S.
19	L	6 41.90	1.849	8 34 20.90	121.11	17 37 58.2	606.7	64.30	14 49.3	54 17.9	
19	U	19 3.86	1.812	8 58 20.32	118.87	15 31 9.9	660.2	63.67	14 50.8	54 23.5	II. S.
20	L	7 25.41	1.782	9 21 55.47	117.07	13 14 16.8	707.5	63.15	14 53.0	54 31.6	
20	U	19 46.66	1.761	9 45 12.09	115.79	+10 48 33.2	−748.7	62.76	14 55.9	54 42.3	II. S.
21	L	8 7.70	1.748	10 8 16.59	115.06	8 15 13.1	783.6	62.53	14 59.5	54 55.3	
21	U	20 28.66	1.746	10 31 15.88	114.93	5 35 31.7	812.2	62.46	15 3.6	55 10.3	II. S.
22	L	8 49.66	1.755	10 54 17.37	115.43	2 50 47.1	834.0	62.56	15 8.2	55 27.1	
22	U	21 10.82	1.774	11 17 28.74	116.58	+ 0 2 23.3	−848.6	62.85	15 13.2	55 45.5	II. S.

Oct. 9, U Defective **Illumination of** ***N*. 0″.57.**

Oct. 16, U Defective Illumination of *N*. 0″.53.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Oct. 23	L	9 32.28	1.804	11 40 57.99	118.41	− 2 48 8.4	−855.2	63.32	15 18.5	56 5.0	
23	U	21 54.17	1.846	12 4 53.33	120.93	5 39 5.7	852.7	63.98	15 24.0	56 25.2	II. S.
24	L	10 16.63	1.899	12 29 22.94	124.13	8 28 34.0	840.2	64.82	15 29.6	56 45.9	
24	U	22 39.80	1.963	12 54 34.88	127.98	11 14 23.6	816.1	65.83	15 35.2	57 6.5	II. S.
25	L	11 3.79	2.037	13 20 36.70	132.42	−13 54 9.3	−779.2	66.99	15 40.8	57 26.8	
25	U	23 28.72	2.119	13 47 34.95	137.36	16 25 9.9	728.4	68.26	15 46.1	57 46.2	
26	L	11 54.67	2.207	14 15 34.63	142.62	18 44 29.7	662.4	69.60	15 51.0	58 4.4	
27	U	0 21.69	2.296	14 44 38.24	147.97	20 49 3.0	580.6	70.96	15 55.6	58 21.1	
27	L	12 49.75	2.381	15 14 45.14	153.11	−22 35 40.5	−483.1	72.24	15 59.6	58 36.0	
28	U	1 18.79	2.457	15 45 50.65	157.68	24 1 19.7	371.1	73.37	16 3.1	58 48.9	I. N.
28	L	13 48.66	2.517	16 17 45.71	161.31	25 3 17.4	246.6	74.28	16 6.0	58 59.6	
29	U	2 19.13	2.556	16 50 17.00	163.67	25 39 22.9	−113.1	74.88	16 8.4	59 8.2	I. N.
29	L	14 49.92	2.571	17 23 7.89	164.55	−25 48 12.6	+ 25.2	75.12	16 10.1	59 14.6	
30	U	3 20.73	2.560	17 56 0.12	163.90	25 29 17.0	163.7	75.00	16 11.3	59 18.9	I. N.
30	L	15 51.27	2.526	18 28 35.74	161.83	24 43 2.6	297.6	74.54	16 11.9	59 21.2	
31	U	4 21.28	2.472	19 0 39.18	158.59	23 30 50.3	422.8	73.79	16 12.1	59 21.7	I. S.
31	L	16 50.55	2.405	19 31 58.62	154.55	−21 54 43.3	+536.2	72.83	16 11.8	59 20.5	
Nov. 1	U	5 18.97	2.331	20 2 26.67	150.09	19 57 15.3	635.9	71.74	16 11.0	59 17.8	I. S.
1	L	17 46.48	2.256	20 32 0.46	145.56	17 41 18.5	721.0	70.61	16 9.9	59 13.8	
2	U	6 13.11	2.184	21 0 40.92	141.25	15 9 51.7	791.0	69.52	16 8.5	59 8.6	I. S.
2	L	18 38.92	2.119	21 28 32.11	137.38	−12 25 53.7	+846.3	68.52	16 6.8	59 2.4	
3	U	7 4.02	2.065	21 55 40.27	134.10	9 32 18.0	887.3	67.65	16 4.8	58 55.1	I. S.
3	L	19 28.53	2.022	22 22 13.12	131.50	6 31 51.1	914.9	66.95	16 2.6	58 46.8	
4	U	7 52.59	1.991	22 48 19.12	129.63	3 27 11.4	929.5	66.43	16 0.1	58 37.6	I. S.
4	L	20 16.36	1.972	23 14 7.13	128.50	− 0 20 51.1	+931.8	66.10	15 57.3	58 27.4	
5	U	8 39.97	1.965	23 39 45.93	128.09	+ 2 44 43.2	921.9	65.96	15 54.3	58 16.3	I. S.
5	L	21 3.57	1.970	0 5 23.95	128.36	5 47 9.2	900.5	66.00	15 51.0	58 4.3	
6	U	9 27.28	1.985	0 31 8.97	129.25	8 44 7.4	867.4	66.20	15 47.4	57 51.3	I. S.
6	L	21 51.22	2.008	0 57 7.89	130.66	+11 33 20.7	+823.0	66.54	15 43.6	57 37.3	
7	U	10 15.49	2.038	1 23 26.42	132.50	14 12 34.9	767.5	67.00	15 39.6	57 22.5	I. S.
7	L	22 40.16	2.074	1 50 8.73	134.59	16 39 39.9	701.5	67.53	15 35.4	57 7.0	
8	U	11 5.26	2.110	2 17 17.16	136.81	18 52 31.6	625.4	68.09	15 31.0	56 50.8	I. N.*S*.
8	L	23 30.80	2.146	2 44 51.97	138.95	+20 49 14.4	+540.2	68.63	15 26.4	56 34.2	
9	U	11 56.74	2.177	3 12 51.06	140.83	22 28 7.0	447.3	69.10	15 21.8	56 17.3	II. N.
10	L	0 23.02	2.200	3 41 9.95	142.23	23 47 45.3	348.2	69.47	15 17.2	56 0.4	
10	U	12 49.51	2.213	4 9 42.06	143.00	24 47 6.6	244.8	69.68	15 12.7	55 43.8	II. N.
11	L	1 16.08	2.214	4 38 19.04	143.03	+25 25 33.5	+139.5	69.71	15 8.3	55 27.7	
11	U	13 42.58	2.201	5 6 51.58	142.25	25 42 55.6	+ 34.5	69.55	15 4.2	55 12.5	II. N.
12	L	2 8.85	2.175	5 35 10.23	140.72	25 39 29.3	− 68.2	69.19	15 0.3	54 58.3	
12	U	14 34.74	2.138	6 3 6.16	138.49	25 15 55.5	166.6	68.65	14 56.8	54 45.6	II. N.*S*.
13	L	3 0.13	2.092	6 30 32.02	135.73	+24 33 14.9	−259.2	67.98	14 53.8	54 34.5	
13	U	15 24.93	2.040	6 57 22.40	132.62	23 32 43.7	344.9	67.20	14 51.3	54 25.4	II. S.
14	L	3 49.08	1.986	7 23 34.08	129.32	22 15 47.4	423.3	66.37	14 49.4	54 18.4	
14	U	16 12.58	1.931	7 49 6.05	126.02	20 43 56.1	494.1	65.52	14 48.1	54 13.7	II. S.
15	L	4 35.43	1.879	8 13 59.32	122.89	+18 58 40.0	−557.4	64.71	14 47.6	54 11.6	

Nov. 8, U Defective Illumination of *S*. 0″.24. **Nov. 12, U Defective Illumination of S. 0″.09.**

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Nov. 15	U	16 57.69	1.832	8 38 16.63	120.06	+17 1 26.9	−613.6	63.96	14 47.7	54 12.0	II. S.
16	L	5 19.42	1.791	9 2 2.19	117.62	14 53 40.4	663.1	63.30	14 48.6	54 15.2	
16	U	17 40.71	1.759	9 25 21.35	115.67	12 36 39.0	706.1	62.77	14 50.2	54 21.1	II. S.
17	L	6 1.66	1.735	9 48 20.37	114.27	10 11 36.5	743.2	62.39	14 52.6	54 29.8	
17	U	18 22.40	1.722	10 11 6.21	113.48	+ 7 39 44.3	−774.5	62.15	14 55.7	54 41.3	II. S.
18	L	6 43.04	1.720	10 33 46.34	113.33	5 2 11.7	799.9	62.09	14 59.5	54 55.4	
18	U	19 3.72	1.729	10 56 28.76	113.86	+ 2 20 9.3	819.4	62.22	15 4.0	55 12.0	II. S.
19	L	7 24.58	1.749	11 19 21.84	115.11	− 0 25 9.2	832.6	62.55	15 9.2	55 31.0	
19	U	19 45.76	1.782	11 42 34.34	117.10	− 3 12 23.2	−838.6	63.08	15 15.0	55 52.1	II. S.
20	L	8 7.41	1.828	12 6 15.24	119.84	6 0 2.1	836.5	63.81	15 21.2	56 15.0	
20	U	20 29.68	1.887	12 30 33.72	123.36	8 46 22.5	825.1	64.73	15 27.8	56 39.3	II. S.
21	L	8 52.73	1.958	12 55 38.92	127.63	11 29 24.2	803.1	65.84	15 34.7	57 4.6	
21	U	21 16.71	2.040	13 21 39.58	132.59	−14 6 48.4	−768.7	67.12	15 41.7	57 30.3	II. S.
22	L	9 41.74	2.133	13 48 43.55	138.16	16 35 55.1	719.9	68.53	15 48.7	57 56.0	
22	U	22 7.92	2.232	14 16 57.05	144.15	18 53 43.9	655.4	70.03	15 55.5	58 21.0	II. S.
23	L	10 35.31	2.334	14 46 23.67	150.29	20 56 57.0	573.8	71.54	16 2.0	58 44.7	
23	U	23 3.92	2.433	15 17 3.37	156.25	−22 42 6.4	−474.8	72.98	16 7.9	59 6.5	
24	L	11 33.67	2.522	15 48 51.31	161.59	24 5 45.5	359.0	74.26	16 13.2	59 25.9	
25	U	0 4.38	2.593	16 21 37.28	165.85	25 4 44.7	228.7	75.28	16 17.7	59 42.3	
25	L	12 35.80	2.639	16 55 5.74	168.61	25 36 31.4	− 87.7	75.94	16 21.2	59 55.4	
26	U	1 7.59	2.655	17 28 56.89	169.60	−25 39 26.4	+ 58.9	76.19	16 23.8	60 4.8	I. N.
26	L	13 39.40	2.641	18 2 48.79	168.74	25 12 58.3	205.1	76.01	16 25.4	60 10.5	
27	U	2 10.86	2.598	18 36 19.99	166.19	24 17 46.7	345.2	75.44	16 25.9	60 12.4	I. S.
27	L	14 41.67	2.533	19 9 12.03	162.29	22 55 36.3	474.2	74.55	16 25.5	60 10.8	
28	U	3 11.61	2.454	19 41 11.32	157.48	−21 9 5.0	+588.3	73.42	16 24.1	60 5.8	I. S.
28	L	15 40.53	2.366	20 12 9.76	152.22	19 1 23.6	685.6	72.17	16 21.9	59 57.8	
29	U	4 8.40	2.278	20 42 4.66	146.95	16 36 0.4	765.3	70.89	16 19.1	59 47.5	I. S.
29	L	16 35.24	2.196	21 10 57.75	141.97	13 56 26.0	827.6	69.66	16 15.7	59 34.8	
30	U	5 1.14	2.122	21 38 54.16	137.54	−11 6 2.8	+873.6	68.54	16 11.8	59 20.6	I. S.
30	L	17 26.22	2.060	22 6 1.36	133.79	8 8 0.3	904.5	67.58	16 7.6	59 5.2	
Dec. 1	U	5 50.63	2.010	22 32 28.17	130.82	5 5 12.4	921.3	66.79	16 3.1	58 48.9	I. S.
1	L	18 14.52	1.974	22 58 24.11	128.65	− 2 0 18.0	925.7	66.23	15 58.6	58 32.1	
2	U	6 38.07	1.952	23 23 58.85	127.29	+ 1 4 17.5	+918.4	65.85	15 53.9	58 15.1	I. S.
2	L	19 1.42	1.942	23 49 21.92	126.69	4 6 19.3	900.2	65.68	15 49.3	57 58.1	
3	U	7 24.72	1.944	0 14 42.33	126.83	7 3 40.8	871.7	65.70	15 44.7	57 41.1	I. S.
3	L	19 48.12	1.957	0 40 8.36	127.62	9 54 20.8	833.3	65.88	15 40.1	57 24.4	
4	U	8 11.73	1.980	1 5 47.35	128.97	+12 36 22.1	+785.3	66.20	15 35.6	57 8.0	I. S.
4	L	20 35.66	2.010	1 31 45.45	130.77	15 7 49.5	727.7	66.64	15 31.2	56 51.9	
5	U	8 59.99	2.045	1 58 7.25	132.90	17 26 51.2	661.0	67.17	15 27.0	56 36.3	I. S.
5	L	21 24.76	2.083	2 24 55.55	135.16	19 31 38.4	585.4	67.72	15 22.8	56 21.0	
6	U	9 49.97	2.120	2 52 11.00	137.39	+21 20 28.7	+501.7	68.27	15 18.8	56 6.1	I. S.
6	L	22 15.61	2.153	3 19 51.91	139.37	22 51 49.1	410.6	68.75	15 14.8	55 51.6	
7	U	10 41.61	2.178	3 47 54.21	140.92	24 4 20.4	313.7	69.12	15 11.0	55 37.6	I. N.S.
7	L	23 7.85	2.194	4 16 11.58	141.86	24 57 1.8	212.6	69.34	15 7.3	55 24.1	
8	U	11 34.21	2.197	4 44 35.83	142.06	+25 29 14.8	+109.3	69.38	15 3.8	55 11.2	I. N.S.

Dec. 8, U Defective Illumination of *S.* 0″.64.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Dec. 9	L	0 0.53	2.187	5 12 57.63	141.44	+25 40 46.5	+ 6.1	69.23	15 0.5	54 59.0	
9	U	12 26.65	2.164	5 41 7.32	140.04	25 31 49.8	− 95.0	68.88	14 57.4	54 47.7	II. N.*S.*
10	L	0 52.42	2.129	6 8 55.74	137.93	25 3 3.0	191.9	68.35	14 54.5	54 37.2	
10	U	13 17.70	2.084	6 36 15.11	135.23	24 15 25.6	283.2	67.67	14 52.0	54 27.9	II. *N.*S.
11	L	1 42.40	2.032	7 2 59.47	132.12	+23 10 14.3	−367.5	66.89	14 49.8	54 19.9	
11	U	14 6.46	1.977	7 29 5.08	128.79	21 48 57.1	444.1	66.05	14 48.0	54 13.3	II. S.
12	L	2 29.84	1.921	7 54 30.40	125.43	20 13 8.1	512.8	65.19	14 46.7	54 8.3	
12	U	14 52.57	1.867	8 19 16.00	122.20	18 24 23.4	573.4	64.35	14 45.8	54 5.2	II. S.
13	L	3 14.68	1.818	8 43 24.25	119.23	+16 24 16.7	−626.4	63.58	14 45.5	54 4.1	
13	U	15 36.23	1.775	9 6 59.08	116.64	14 14 18.0	672.2	62.90	14 45.8	54 5.1	II. S.
14	L	3 57.31	1.740	9 30 5.59	114.53	11 55 51.3	711.1	62.34	14 46.7	54 8.4	
14	U	16 18.02	1.713	9 52 49.81	112.94	9 30 15.7	743.7	61.93	14 48.3	54 14.2	II. S.
15	L	4 38.47	1.697	10 15 18.58	111.95	+ 6 58 45.5	−770.3	61.67	14 50.5	54 22.5	
15	U	16 58.79	1.691	10 37 39.28	111.60	4 22 31.3	791.1	61.59	14 53.5	54 33.4	II. S.
16	L	5 19.10	1.697	10 59 59.82	111.94	+ 1 42 42.1	806.1	61.70	14 57.2	54 47.0	
16	U	17 39.55	1.714	11 22 28.57	112.98	− 0 59 31.8	815.2	62.00	15 1.6	55 3.2	II. S.
17	L	6 0.29	1.744	11 45 14.30	114.77	− 3 42 56.7	−817.8	62.51	15 6.8	55 22.1	
17	U	18 21.46	1.786	12 8 26.14	117.34	6 26 12.1	813.4	63.22	15 12.6	55 43.3	II. S.
18	L	6 43.21	1.842	12 32 13.53	120.69	9 7 47.3	800.9	64.13	15 19.0	56 6.9	
18	U	19 5.72	1.911	12 56 46.04	124.85	11 45 57.8	779.1	65.24	15 26.0	56 32.6	II. S.
19	L	7 29.14	1.993	13 22 13.13	129.79	−14 18 41.2	−746.2	66.53	15 33.4	56 59.9	
19	U	19 53.61	2.087	13 48 43.72	135.42	16 43 35.5	700.6	67.98	15 41.2	57 28.5	II. S.
20	L	8 19.27	2.190	14 16 25.53	141.63	18 57 56.6	640.3	69.54	15 49.2	57 57.9	
20	U	20 46.20	2.299	14 45 24.12	148.18	20 58 38.1	563.7	71.16	15 57.3	58 27.5	II. S.
21	L	9 14.44	2.408	15 15 41.81	154.74	−22 42 17.1	−469.8	72.75	16 5.2	58 56.5	
21	U	21 43.97	2.511	15 47 16.37	160.91	24 5 21.8	358.1	74.21	16 12.7	59 24.1	II. S.
22	L	10 14.64	2.598	16 20 0.03	166.18	25 4 26.7	230.1	75.44	16 19.7	59 49.7	
22	U	22 46.23	2.663	16 53 39.08	170.06	25 36 31.8	− 88.8	76.33	16 25.9	60 12.4	II. N.
23	L	11 18.43	2.698	17 27 54.34	172.17	−25 39 24.2	+ 61.1	76.80	16 31.1	60 31.5	
23	U	23 50.85	2.700	18 2 23.12	172.20	25 11 57.3	213.3	76.82	16 35.1	60 46.3	
24	L	12 23.10	2.670	18 36 41.80	170.51	24 14 22.0	361.3	76.41	16 37.9	60 56.4	
25	U	0 54.82	2.613	19 10 28.88	167.09	22 48 6.9	499.0	75.62	16 39.3	61 1.5	
25	L	13 25.74	2.537	19 43 27.34	162.50	−20 55 48.4	+621.3	74.55	16 39.3	61 1.5	
26	U	1 55.67	2.449	20 15 26.02	157.22	18 40 51.3	725.0	73.30	16 38.0	60 56.7	I. S.
26	L	14 24.51	2.358	20 46 19.67	151.73	16 7 9.6	808.5	71.99	16 35.4	60 47.2	
27	U	2 52.28	2.270	21 16 8.35	146.44	13 18 46.1	872.0	70.70	16 31.7	60 33.7	I. S.
27	L	15 19.03	2.190	21 44 56.14	141.63	−10 19 38.3	+916.1	69.52	16 27.1	60 16.7	
28	U	3 44.88	2.121	22 12 49.97	137.47	7 13 28.6	942.5	68.49	16 21.7	59 56.9	I. S.
28	L	16 9.98	2.065	22 39 58.51	134.08	4 3 40.0	953.0	67.64	16 15.7	59 34.9	
29	U	4 34.49	2.022	23 6 31.28	131.51	− 0 53 13.9	949.1	66.99	16 9.3	59 11.4	I. S.
29	L	16 58.57	1.993	23 32 38.12	129.76	+ 2 15 8.3	+932.6	66.54	16 2.7	58 47.1	
30	U	5 22.38	1.977	23 58 28.63	128.79	5 19 3.5	904.8	66.30	15 56.0	58 22.5	I. S.
30	L	17 46.06	1.973	0 24 11.91	128.55	8 16 22.6	866.7	66.24	15 49.3	57 58.1	
31	U	6 9.76	1.980	0 49 56.28	128.95	11 5 8.3	819.3	66.34	15 42.8	57 34.3	I. S.
31	L	18 33.61	1.996	1 15 49.05	129.92	+13 43 31.9	+763.1	66.59	15 36.5	57 11.3	

Dec. 9, U Defective Illumination of *S.* 0″.51. Dec. 10, U Defective Illumination of *N.* 0″.00.

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s
Jan. 1	0 47	19 26 52.35	−24 7 45.2	6.5	2.5	0.18
2	0 50	19 33 55.48	23 52 40.5	6.6	2.5	0.18
3	0 53	19 40 56.74	23 36 1.2	6.6	2.5	0.18
4	0 56	19 47 55.68	23 17 48.2	6.7	2.5	0.18
5	0 59	19 54 51.80	22 58 1.8	6.8	2.6	0.19
6	1 2	20 1 44.48	−22 36 43.5	6.9	2.6	0.19
7	1 5	20 8 33.08	22 13 55.1	7.0	2.6	0.19
8	1 7	20 15 16.87	21 49 38.7	7.1	2.7	0.19
9	1 10	20 21 55.01	21 23 57.3	7.2	2.7	0.20
10	1 13	20 28 26.51	20 56 55.0	7.3	2.8	0.20
11	1 15	20 34 50.37	−20 28 36.0	7.4	2.8	0.20
12	1 17	20 41 5.33	19 59 6.2	7.5	2.9	0.20
13	1 20	20 47 10.02	19 28 32.9	7.7	2.9	0.20
14	1 22	20 53 2.89	18 57 4.3	7.8	3.0	0.21
15	1 23	20 58 42.23	18 24 50.0	8.0	3.0	0.21
16	1 25	21 4 6.07	−17 52 2.0	8.2	3.1	0.22
17	1 26	21 9 12.27	17 18 54.0	8.4	3.2	0.22
18	1 27	21 13 58.46	16 45 41.3	8.6	3.3	0.23
19	1 27	21 18 22.10	16 12 41.7	8.8	3.3	0.23
20	1 27	21 22 20.41	15 40 15.4	9.1	3.4	0.24
21	1 27	21 25 50.52	−15 8 43.7	9.3	3.5	0.24
22	1 26	21 28 49.48	14 38 30.3	9.6	3.6	0.25
23	1 24	21 31 14.37	14 10 0.1	9.9	3.8	0.25
24	1 22	21 33 2.34	13 43 39.0	10.2	3.9	0.26
25	1 19	21 34 10.89	13 19 52.7	10.5	4.0	0.27
26	1 16	21 34 37.93	−12 59 5.8	10.9	4.1	0.28
27	1 12	21 34 22.03	12 41 41.3	11.2	4.2	0.29
28	1 7	21 33 22.62	12 27 58.4	11.5	4.4	0.30
29	1 1	21 31 40.12	12 18 11.7	11.9	4.5	0.31
30	0 55	21 29 16.17	12 12 30.3	12.2	4.6	0.31
31	0 48	21 26 13.78	−12 10 56.4	12.5	4.7	0.32
Feb. 1	0 40	21 22 37.23	12 13 24.2	12.8	4.9	0.33
2	0 32	21 18 32.07	12 19 40.7	13.0	4.9	0.34
3	0 24	21 14 4.94	12 29 26.2	13.2	5.0	0.34
4	0 15	21 9 23.21	12 42 14.1	13.4	5.1	0.35
5	0 6	21 4 34.73	−12 57 34.2	13.5	5.1	0.35
5	23 58	20 59 47.24	13 14 53.7	13.5	5.1	0.35
6	23 49	20 55 8.14	13 33 39.0	13.5	5.1	0.35
7	23 41	20 50 44.05	13 53 18.3	13.5	5.1	0.35
8	23 33	20 46 40.59	14 13 21.8	13.4	5.1	0.35
9	23 25	20 43 2.27	−14 33 23.8	13.3	5.0	0.35
10	23 18	20 39 52.43	14 53 1.9	13.1	5.0	0.34
11	23 12	20 37 13.27	15 11 58.4	12.9	4.9	0.34
12	23 6	20 35 6.02	15 29 58.6	12.7	4.8	0.33
13	23 0	20 33 31.03	15 46 51.8	12.5	4.8	0.33
14	22 55	20 32 28.01	−16 2 29.3	12.3	4.7	0.32
15	*22 51*	*20 31 56.07*	*−16 16 45.3*	12.1	4.6	0.32
Feb. 15	22 51	20 31 56.07	−16 16 45.3	12.1	4.6	0.32
16	22 47	20 31 54.04	16 29 35.5	11.8	4.5	0.31
17	22 43	20 32 20.40	16 40 56.9	11.6	4.4	0.31
18	22 40	20 33 13.53	16 50 47.7	11.4	4.3	0.30
19	22 38	20 34 31.73	16 59 6.9	11.2	4.2	0.30
20	22 35	20 36 13.24	−17 5 53.9	10.9	4.1	0.29
21	22 33	20 38 16.40	17 11 8.7	10.7	4.1	0.29
22	22 32	20 40 39.56	17 14 51.5	10.5	4.0	0.28
23	22 31	20 43 21.15	17 17 2.4	10.3	3.9	0.27
24	22 30	20 46 19.72	17 17 42.3	10.2	3.9	0.27
25	22 29	20 49 33.88	−17 16 51.8	10.0	3.8	0.26
26	22 29	20 53 2.34	17 14 31.6	9.8	3.7	0.26
27	22 28	20 56 43.94	17 10 42.2	9.6	3.7	0.25
28	22 28	21 0 37.60	17 5 24.8	9.5	3.6	0.25
29	22 28	21 4 42.30	16 58 39.9	9.3	3.5	0.25
Mar. 1	22 29	21 8 57.16	−16 50 28.3	9.2	3.5	0.24
2	22 29	21 13 21.34	16 40 50.8	9.0	3.4	0.24
3	22 30	21 17 54.09	16 29 48.2	8.9	3.4	0.23
4	22 30	21 22 34.72	16 17 21.4	8.8	3.3	0.23
5	22 31	21 27 22.62	16 3 31.0	8.7	3.3	0.23
6	22 32	21 32 17.23	−15 48 17.7	8.5	3.2	0.22
7	22 33	21 37 18.07	15 31 42.2	8.4	3.2	0.22
8	22 34	21 42 24.66	15 13 45.3	8.3	3.1	0.22
9	22 36	21 47 36.59	14 54 27.7	8.2	3.1	0.21
10	22 37	21 52 53.55	14 33 49.8	8.1	3.1	0.21
11	22 38	21 58 15.18	−14 11 52.6	8.0	3.0	0.21
12	22 40	22 3 41.23	13 48 36.5	7.9	3.0	0.21
13	22 42	22 9 11.42	13 24 2.2	7.8	3.0	0.20
14	22 43	22 14 45.56	12 58 10.4	7.7	2.9	0.20
15	22 45	22 20 23.48	12 31 1.8	7.7	2.9	0.20
16	22 47	22 26 5.02	−12 2 36.6	7.6	2.9	0.20
17	22 48	22 31 50.06	11 32 55.9	7.5	2.8	0.19
18	22 50	22 37 38.49	11 2 0.0	7.4	2.8	0.19
19	22 52	22 43 30.24	10 29 49.7	7.4	2.8	0.19
20	22 54	22 49 25.28	9 56 25.6	7.3	2.8	0.19
21	22 56	22 55 23.58	− 9 21 48.3	7.2	2.7	0.19
22	22 58	23 1 25.11	8 45 58.4	7.2	2.7	0.18
23	23 0	23 7 29.91	8 8 56.7	7.1	2.7	0.18
24	23 3	23 13 38.01	7 30 44.0	7.1	2.7	0.18
25	23 5	23 19 49.46	6 51 20.8	7.0	2.7	0.18
26	23 7	23 26 4.32	− 6 10 48.3	7.0	2.6	0.18
27	23 9	23 32 22.69	5 29 7.3	6.9	2.6	0.18
28	23 12	23 38 44.67	4 46 18.8	6.9	2.6	0.17
29	23 14	23 45 10.39	4 2 23.8	6.8	2.6	0.17
30	23 17	23 51 39.95	3 17 23.8	6.8	2.6	0.17
31	23 19	23 58 13.54	− 2 31 20.1	6.7	2.6	0.17
Apr. 1	23 22	0 4 51.26	− 1 44 14.2	6.7	2.5	0.17

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Apr. 1	23 22	0 4 51.26	− 1 44 14.2	6.7	2.5	0.17	May 18	1 21	5 5 44.01	+24 41 15.9	12.2	4.6	0.34
2	23 25	0 11 33.31	0 56 8.0	6.7	2.5	0.17	19	1 19	5 7 49.58	24 34 12.7	12.5	4.8	0.35
3	23 28	0 18 19.84	− 0 7 3.6	6.7	2.5	0.17	20	1 17	5 9 34.37	24 25 41.0	12.8	4.9	0.35
4	23 31	0 25 11.04	+ 0 42 56.9	6.6	2.5	0.17	21	1 15	5 10 58.33	24 15 44.7	13.1	5.0	0.36
5	23 34	0 32 7.06	1 33 50.5	6.6	2.5	0.17	22	1 12	5 12 1.48	24 4 27.4	13.4	5.1	0.37
6	23 37	0 39 8.02	+ 2 25 33.8	6.6	2.5	0.17	23	1 9	5 12 43.99	+23 51 53.7	13.7	5.2	0.38
7	23 40	0 46 14.11	3 18 3.6	6.6	2.5	0.17	24	1 5	5 13 6.13	23 38 7.8	14.0	5.3	0.39
8	23 43	0 53 25.44	4 11 15.4	6.6	2.5	0.17	25	1 1	5 13 8.41	23 23 14.3	14.3	5.4	0.39
9	23 46	1 0 42.09	5 5 4.2	6.6	2.5	0.17	26	0 57	5 12 51.40	23 7 18.4	14.5	5.5	0.40
10	23 50	1 8 4.10	5 59 24.7	6.6	2.5	0.17	27	0 52	5 12 15.91	22 50 25.9	14.8	5.6	0.41
11	23 53	1 15 31.49	+ 6 54 10.4	6.6	2.5	0.17	28	0 48	5 11 22.96	+22 32 43.1	15.0	5.7	0.41
12	23 57	1 23 4.17	7 49 14.0	6.6	2.5	0.17	29	0 43	5 10 13.74	22 14 16.9	15.2	5.8	0.42
14	0 1	1 30 41.97	8 44 27.2	6.6	2.5	0.17	30	0 37	5 8 49.70	21 55 15.0	15.4	5.9	0.42
15	0 4	1 38 24.67	9 39 41.3	6.6	2.5	0.17	31	0 32	5 7 12.44	21 35 46.5	15.6	5.9	0.42
16	0 8	1 46 11.98	10 34 46.3	6.7	2.5	0.17	June 1	0 26	5 5 23.75	21 16 0.6	15.7	6.0	0.43
17	0 12	1 54 3.36	+11 29 30.8	6.7	2.5	0.17	2	0 20	5 3 25.62	+20 56 7.6	15.8	6.0	0.43
18	0 16	2 1 58.30	12 23 43.9	6.7	2.6	0.17	3	0 14	5 1 20.14	20 36 18.2	15.9	6.0	0.43
19	0 20	2 9 56.10	13 17 12.9	6.8	2.6	0.18	4	0 8	4 59 9.53	20 16 43.8	16.0	6.1	0.43
20	0 24	2 17 55.94	14 9 45.2	6.8	2.6	0.18	5	0 2	4 56 56.07	19 57 36.2	16.0	6.1	0.43
21	0 28	2 25 56.88	15 1 7.9	6.9	2.6	0.18	5	23 56	4 54 42.10	19 39 7.0	16.0	6.1	0.43
22	0 32	2 33 57.88	+15 51 8.4	7.0	2.7	0.18	6	23 49	4 52 29.88	+19 21 28.0	15.9	6.0	0.43
23	0 36	2 41 57.84	16 39 34.3	7.1	2.7	0.19	7	23 43	4 50 21.67	19 4 50.1	15.9	6.0	0.42
24	0 40	2 49 55.53	17 26 14.1	7.2	2.7	0.19	8	23 37	4 48 19.59	18 49 24.0	15.8	6.0	0.42
25	0 44	2 57 49.77	18 10 57.1	7.3	2.8	0.19	9	23 32	4 46 25.64	18 35 19.2	15.7	5.9	0.42
26	0 48	3 5 39.31	18 53 33.8	7.4	2.8	0.20	10	23 26	4 44 41.68	18 22 44.3	15.5	5.9	0.41
27	0 52	3 13 22.90	+19 33 56.5	7.5	2.9	0.20	11	23 21	4 43 9.41	+18 11 46.5	15.3	5.8	0.41
28	0 56	3 20 59.34	20 11 58.6	7.7	2.9	0.21	12	23 15	4 41 50.30	18 2 31.5	15.1	5.7	0.40
29	0 59	3 28 27.48	20 47 35.2	7.8	3.0	0.21	13	23 10	4 40 45.63	17 55 3.7	14.8	5.6	0.40
30	1 2	3 35 46.24	21 20 42.8	8.0	3.0	0.21	14	23 6	4 39 56.52	17 49 26.1	14.6	5.5	0.39
May 1	1 6	3 42 54.58	21 51 19.6	8.1	3.1	0.22	15	23 1	4 39 23.90	17 45 40.3	14.3	5.4	0.39
2	1 9	3 49 51.52	+22 19 24.8	8.3	3.1	0.22	16	22 57	4 39 8.52	+17 43 46.7	14.1	5.3	0.38
3	1 11	3 56 36.21	22 44 58.9	8.5	3.2	0.23	17	22 53	4 39 10.97	17 43 44.0	13.8	5.2	0.37
4	1 14	4 3 7.80	23 8 3.4	8.7	3.3	0.24	18	22 49	4 39 31.68	17 45 30.4	13.5	5.1	0.36
5	1 16	4 9 25.55	23 28 40.2	8.9	3.4	0.25	19	22 46	4 40 11.00	17 49 2.4	13.2	5.0	0.35
6	1 18	4 15 28.72	23 46 52.6	9.1	3.5	0.26	20	22 43	4 41 9.16	17 54 16.3	12.9	4.9	0.34
7	1 20	4 21 16.68	+24 2 43.8	9.3	3.5	0.26	21	22 40	4 42 26.28	+18 1 7.0	12.6	4.8	0.34
8	1 22	4 26 48.80	24 16 17.6	9.5	3.6	0.27	22	22 38	4 44 2.46	18 9 29.4	12.3	4.7	0.33
9	1 23	4 32 4.49	24 27 37.9	9.8	3.7	0.27	23	22 36	4 45 57.70	18 19 17.2	12.0	4.6	0.32
10	1 24	4 37 3.23	24 36 49.2	10.0	3.8	0.28	24	22 34	4 48 12.01	18 30 24.0	11.8	4.5	0.31
11	1 25	4 41 44.44	24 43 55.4	10.3	3.9	0.28	25	22 33	4 50 45.34	18 42 43.0	11.5	4.4	0.31
12	1 25	4 46 7.65	+24 49 1.1	10.5	4.0	0.29	26	22 32	4 53 37.64	+18 56 6.6	11.2	4.3	0.30
13	1 26	4 50 12.38	24 52 10.4	10.8	4.1	0.30	27	22 31	4 56 48.86	19 10 27.4	10.9	4.1	0.29
14	1 25	4 53 58.17	24 53 27.5	11.1	4.2	0.31	28	22 31	5 0 18.95	19 25 37.2	10.7	4.0	0.29
15	1 25	4 57 24.58	24 52 56.7	11.4	4.3	0.32	29	22 31	5 4 7.85	19 41 27.8	10.4	4.0	0.28
16	1 24	5 0 31.25	24 50 41.9	11.7	4.4	0.32	30	22 31	5 8 15.52	19 57 50.5	10.1	3.9	0.28
17	1 23	5 3 17.81	+24 46 47.0	12.0	4.5	0.33	July 1	22 31	5 12 41.89	+20 14 36.5	9.9	3.8	0.27
18	1 21	5 5 44.01	+24 41 15.9	12.2	4.6	0.34	2	22 32	5 17 26.96	+20 31 38.2	9.7	3.7	0.2[illegible]

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s
July 1	22 31	5 12 41.89	+20 14 36.5	9.9	3.8	0.27
2	22 32	5 17 26.96	20 31 36.2	9.7	3.7	0.27
3	22 33	5 22 30.66	20 48 40.0	9.4	3.6	0.26
4	22 35	5 27 52.92	21 5 38.0	9.2	3.5	0.25
5	22 36	5 33 33.67	21 22 19.6	9.0	3.4	0.25
6	22 38	5 39 32.79	+21 38 33.8	8.8	3.3	0.24
7	22 41	5 45 50.12	21 54 9.4	8.6	3.3	0.24
8	22 43	5 52 25.36	22 8 54.9	8.4	3.2	0.23
9	22 46	5 59 18.23	22 22 38.2	8.2	3.1	0.23
10	22 50	6 6 28.30	22 35 7.3	8.1	3.1	0.22
11	22 53	6 13 54.96	+22 46 9.7	7.9	3.0	0.22
12	22 57	6 21 37.52	22 55 33.5	7.7	2.9	0.21
13	23 1	6 29 35.09	23 3 6.7	7.6	2.9	0.21
14	23 5	6 37 46.59	23 8 37.9	7.5	2.8	0.21
15	23 10	6 46 10.82	23 11 56.6	7.3	2.8	0.20
16	23 14	6 54 46.33	+23 12 53.4	7.2	2.7	0.20
17	23 19	7 3 31.62	23 11 20.4	7.1	2.7	0.20
18	23 24	7 12 24.92	23 7 11.0	7.0	2.7	0.19
19	23 29	7 21 24.47	23 0 20.8	6.9	2.6	0.19
20	23 34	7 30 28.40	22 50 47.2	6.9	2.6	0.19
21	23 39	7 39 34.87	+22 38 29.7	6.8	2.6	0.19
22	23 44	7 48 42.06	22 23 29.7	6.7	2.6	0.18
23	23 50	7 57 48.22	22 5 50.6	6.7	2.5	0.18
24	23 55	8 6 51.80	21 45 37.1	6.6	2.5	0.18
25	23 59	8 15 51.25	21 22 56.0	6.6	2.5	0.18
27	0 5	8 24 45.36	+20 57 54.6	6.6	2.5	0.18
28	0 9	8 33 32.96	20 30 41.6	6.6	2.5	0.18
29	0 14	8 42 13.21	20 1 25.4	6.5	2.5	0.18
30	0 19	8 50 45.29	19 30 15.9	6.5	2.5	0.18
31	0 23	8 59 8.68	18 57 22.1	6.5	2.5	0.18
Aug. 1	0 28	9 7 22.93	+18 22 53.2	6.5	2.5	0.17
2	0 32	9 15 27.78	17 46 58.6	6.5	2.5	0.17
3	0 36	9 23 23.03	17 9 46.9	6.5	2.5	0.17
4	0 39	9 31 8.62	16 31 26.4	6.6	2.5	0.17
5	0 43	9 38 44.60	15 52 5.1	6.6	2.5	0.17
6	0 47	9 46 11.02	+15 11 50.4	6.6	2.5	0.17
7	0 50	9 53 28.03	14 30 49.2	6.6	2.5	0.17
8	0 53	10 0 35.78	13 49 8.1	6.7	2.5	0.17
9	0 56	10 7 34.52	13 6 52.9	6.7	2.5	0.17
10	0 59	10 14 24.46	12 24 9.4	6.7	2.5	0.17
11	1 2	10 21 5.86	+11 41 2.6	6.8	2.6	0.17
12	1 4	10 27 38.94	10 57 37.5	6.8	2.6	0.18
13	1 7	10 34 3.97	10 13 58.3	6.8	2.6	0.18
14	1 9	10 40 21.21	9 30 9.5	6.9	2.6	0.18
15	1 11	10 46 30.92	8 46 14.5	6.9	2.6	0.18
16	1 13	10 52 33.31	+ 8 2 17.3	7.0	2.7	0.18
17	*1 15*	*10 58 28.62*	+ 7 18 21.0	7.0	2.7	0.18
Aug. 17	1 15	10 58 28.62	+ 7 18 21.0	7.0	2.7	0.18
18	1 17	11 4 17.06	6 34 28.8	7.1	2.7	0.18
19	1 19	11 9 58.81	5 50 43.9	7.2	2.7	0.18
20	1 21	11 15 34.06	5 7 9.2	7.2	2.7	0.18
21	1 22	11 21 3.00	4 23 47.3	7.3	2.8	0.18
22	1 24	11 26 25.73	+ 3 40 40.9	7.4	2.8	0.19
23	1 25	11 31 42.38	2 57 52.5	7.4	2.8	0.19
24	1 26	11 36 53.05	2 15 24.9	7.5	2.8	0.19
25	1 27	11 41 57.85	1 33 20.4	7.6	2.9	0.19
26	1 28	11 46 56.78	0 51 41.3	7.7	2.9	0.19
27	1 29	11 51 49.87	+ 0 10 30.5	7.7	2.9	0.20
28	1 30	11 56 37.15	− 0 30 9.8	7.8	3.0	0.20
29	1 31	12 1 18.58	1 10 17.0	7.9	3.0	0.20
30	1 31	12 5 54.09	1 49 48.4	8.0	3.0	0.20
31	1 32	12 10 23.59	2 28 41.5	8.1	3.1	0.20
Sept. 1	1 32	12 14 46.94	− 3 6 53.1	8.2	3.1	0.21
2	1 33	12 19 4.00	3 44 20.6	8.3	3.2	0.21
3	1 33	12 23 14.54	4 21 0.9	8.3	3.2	0.21
4	1 33	12 27 18.32	4 56 50.5	8.6	3.3	0.22
5	1 33	12 31 15.05	5 31 46.0	8.7	3.3	0.22
6	1 33	12 35 4.39	− 6 5 43.6	8.8	3.3	0.22
7	1 33	12 38 45.93	6 38 39.1	8.9	3.4	0.23
8	1 32	12 42 19.25	7 10 28.5	9.1	3.4	0.23
9	1 32	12 45 43.79	7 41 6.6	9.2	3.5	0.23
10	1 31	12 48 59.01	8 10 28.5	9.4	3.6	0.24
11	1 30	12 52 4.24	− 8 38 28.1	9.5	3.6	0.24
12	1 29	12 54 58.77	9 4 59.7	9.7	3.7	0.25
13	1 28	12 57 41.81	9 29 56.2	9.9	3.7	0.25
14	1 27	13 0 12.44	9 53 9.9	10.0	3.8	0.26
15	1 25	13 2 29.75	10 14 32.9	10.2	3.9	0.26
16	1 23	13 4 32.67	−10 33 55.8	10.4	4.0	0.27
17	1 21	13 6 20.08	10 51 8.7	10.6	4.0	0.27
18	1 18	13 7 50.80	11 6 0.9	10.8	4.1	0.28
19	1 16	13 9 3.57	11 18 20.5	11.0	4.2	0.28
20	1 13	13 9 57.08	11 27 54.8	11.2	4.3	0.29
21	1 9	13 10 30.06	−11 34 30.2	11.5	4.4	0.30
22	1 6	13 10 41.24	11 37 52.7	11.7	4.4	0.30
23	1 1	13 10 29.42	11 37 47.6	11.9	4.5	0.31
24	0 57	13 9 53.57	11 34 0.5	12.1	4.6	0.31
25	0 52	13 8 52.89	11 26 17.4	12.4	4.7	0.32
26	0 47	13 7 26.89	−11 14 26.0	12.6	4.8	0.32
27	0 41	13 5 35.55	10 58 16.4	12.8	4.8	0.33
28	0 35	13 3 19.42	10 37 42.2	12.9	4.9	0.33
29	0 28	13 0 39.68	10 12 42.8	13.1	5.0	0.34
30	0 21	12 57 38.40	9 43 24.2	13.2	5.0	0.34
Oct. 1	0 14	12 54 18.45	− 9 10 0.5	13.3	5.1	0.34
2	0 6	12 50 43.64	− 8 32 56.1	13.4	5.1	0.34

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s
Oct. 1	0 14	12 54 18.45	– 9 10 0.5	13.3	5.1	0.34
2	0 6	12 50 43.64	8 32 56.1	13.4	5.1	0.34
2	23 59	12 46 58.56	7 52 45.0	13.4	5.1	0.34
3	23 51	12 43 8.73	7 10 11.4	13.4	5.1	0.34
4	23 43	12 39 20.14	6 26 9.0	13.3	5.0	0.34
5	23 36	12 35 39.14	– 5 41 37.9	13.2	5.0	0.34
6	23 28	12 32 12.09	4 57 42.3	13.0	4.9	0.33
7	23 21	12 29 5.08	4 15 26.7	12.8	4.9	0.33
8	23 15	12 26 23.61	3 35 52.9	12.5	4.8	0.32
9	23 9	12 24 12.31	2 59 55.9	12.2	4.6	0.31
10	23 3	12 22 34.83	– 2 28 21.7	11.9	4.5	0.30
11	22 58	12 21 33.74	2 1 45.9	11.6	4.4	0.29
12	22 54	12 21 10.43	1 40 33.7	11.3	4.3	0.29
13	22 50	12 21 25.29	1 24 58.6	10.9	4.1	0.28
14	22 47	12 22 17.77	1 15 4.8	10.6	4.0	0.27
15	22 45	12 23 46.53	– 1 10 47.6	10.3	3.9	0.26
16	22 43	12 25 49.60	1 11 55.3	9.9	3.8	0.25
17	22 41	12 28 24.58	1 18 10.5	9.6	3.7	0.25
18	22 40	12 31 28.80	1 29 12.3	9.4	3.6	0.24
19	22 40	12 34 59.42	1 44 36.6	9.1	3.5	0.23
20	22 40	12 38 53.59	– 2 3 58.4	8.8	3.4	0.22
21	22 40	12 43 8.57	2 26 52.2	8.6	3.3	0.22
22	22 41	12 47 41.71	2 52 52.[illegible]	8.4	3.2	0.21
23	22 42	12 52 30.57	3 21 35.1	8.2	3.1	0.21
24	22 43	12 57 32.95	3 52 36.8	8.0	3.0	0.20
25	22 44	13 2 46.87	– 4 25 36.3	7.8	3.0	0.20
26	22 46	13 8 10.55	5 0 13.9	7.7	2.9	0.19
27	22 47	13 13 42.49	5 36 11.9	7.5	2.9	0.19
28	22 49	13 19 21.41	6 13 14.0	7.4	2.8	0.19
29	22 51	13 25 6.13	6 51 5.7	7.2	2.8	0.19
30	22 53	13 30 55.76	– 7 29 34.5	7.1	2.7	0.18
31	22 54	13 36 49.47	8 8 28.7	7.0	2.7	0.18
Nov. 1	22 56	13 42 46.66	8 47 38.6	6.9	2.6	0.18
2	22 59	13 48 46.77	9 26 55.1	6.8	2.6	0.18
3	23 1	13 54 49.38	10 6 10.5	6.8	2.6	0.17
4	23 3	14 0 54.12	–10 45 17.8	6.7	2.5	0.17
5	23 5	14 7 0.74	11 24 11.1	6.6	2.5	0.17
6	23 7	14 13 9.06	12 2 45.1	6.5	2.5	0.17
7	23 9	14 19 18.89	12 40 54.9	6.5	2.5	0.17
8	23 12	14 25 30.13	13 18 36.4	6.4	2.4	0.17
9	23 14	14 31 42.69	–13 55 45.9	6.4	2.4	0.17
10	23 16	14 37 56.54	14 32 20.0	6.3	2.4	0.17
11	23 18	14 44 11.65	15 8 15.5	6.3	2.4	0.16
12	23 21	14 50 28.01	15 43 29.9	6.3	2.4	0.16
13	23 23	14 56 45.64	16 18 0.7	6.2	2.4	0.16
14	23 25	15 3 4.55	–16 51 45.4	6.2	2.4	0.16
15	23 28	15 9 24.78	–17 24 42.1	6.2	2.3	0.16
Nov. 15	23 28	15 9 24.78	–17 24 42.1	6.2	2.3	0.16
16	23 30	15 15 46.37	17 56 48.7	6.2	2.3	0.16
17	23 33	15 22 9.37	18 28 3.4	6.1	2.3	0.16
18	23 35	15 28 33.79	18 58 24.2	6.1	2.3	0.16
19	23 38	15 34 59.69	19 27 49.7	6.1	2.3	0.16
20	23 40	15 41 27.14	–19 56 18.1	6.1	2.3	0.16
21	23 43	15 47 56.14	20 23 48.1	6.1	2.3	0.16
22	23 45	15 54 26.74	20 50 17.8	6.1	2.3	0.16
23	23 48	16 0 58.98	21 15 45.9	6.1	2.3	0.16
24	23 50	16 7 32.88	21 40 11.0	6.1	2.3	0.16
25	23 53	16 14 8.46	–22 3 31.5	6.1	2.3	0.17
26	23 56	16 20 45.70	22 25 45.9	6.1	2.3	0.17
27	23 58	16 27 24.65	22 46 52.8	6.1	2.3	0.17
29	0 1	16 34 5.29	23 6 50.9	6.1	2.3	0.17
30	0 4	16 40 47.60	23 25 38.9	6.1	2.3	0.17
Dec. 1	0 7	16 47 31.54	–23 43 15.1	6.1	2.3	0.17
2	0 10	16 54 17.10	23 59 38.1	6.1	2.3	0.17
3	0 12	17 1 4.20	24 14 46.6	6.1	2.3	0.17
4	0 15	17 7 52.81	24 28 39.2	6.2	2.3	0.17
5	0 18	17 14 42.84	24 41 14.6	6.2	2.3	0.17
6	0 21	17 21 34.19	–24 52 31.3	6.2	2.4	0.17
7	0 24	17 28 26.78	25 2 27.6	6.2	2.4	0.17
8	0 27	17 35 20.45	25 11 2.6	6.3	2.4	0.17
9	0 30	17 42 15.08	25 18 14.8	6.3	2.4	0.18
10	0 33	17 49 10.47	25 24 2.9	6.3	2.4	0.18
11	0 36	17 56 6.46	–25 28 25.6	6.4	2.4	0.18
12	0 39	18 3 2.80	25 31 21.8	6.4	2.4	0.18
13	0 42	18 9 59.27	25 32 50.2	6.5	2.5	0.18
14	0 45	18 16 55.58	25 32 49.9	6.5	2.5	0.18
15	0 48	18 23 51.40	25 31 20.0	6.6	2.5	0.18
16	0 51	18 30 46.38	–25 28 19.4	6.6	2.5	0.19
17	0 54	18 37 40.13	25 23 47.8	6.7	2.5	0.19
18	0 57	18 44 32.17	25 17 44.6	6.8	2.6	0.19
19	0 59	18 51 22.02	25 10 9.7	6.8	2.6	0.19
20	1 2	18 58 9.10	25 1 3.0	6.9	2.6	0.19
21	1 5	19 4 52.74	–24 50 24.9	7.0	2.7	0.20
22	1 8	19 11 32.25	24 38 16.1	7.1	2.7	0.20
23	1 10	19 18 6.76	24 24 38.1	7.2	2.7	0.20
24	1 13	19 24 35.39	24 9 32.3	7.3	2.8	0.20
25	1 15	19 30 57.04	23 53 1.3	7.4	2.8	0.21
26	1 18	19 37 10.55	–23 35 8.3	7.6	2.9	0.21
27	1 20	19 43 14.56	23 15 57.2	7.7	2.9	0.21
28	1 22	19 49 7.55	22 55 33.1	7.9	3.0	0.22
29	1 23	19 54 47.84	22 34 2.1	8.0	3.0	0.22
30	1 25	20 0 13.47	22 11 31.7	8.2	3.1	0.22
31	1 26	20 5 22.35	–21 48 10.6	8.4	3.2	0.23
32	1 27	20 10 12.08	–21 24 9.6	8.8	3.3	0.23

VENUS, 1916.

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Jan. 1	2 1	20 41 3.47	−20 5 9.3	6.1	5.9	0.42	Feb. 15	2 33	0 10 39.19	+ 0 27 41.4	7.3	7.1	0.47
2	2 2	20 46 9.85	19 45 59.8	6.1	5.9	0.42	16	2 33	0 14 59.45	0 59 14.3	7.3	7.1	0.48
3	2 3	20 51 14.87	19 26 16.7	6.1	6.0	0.42	17	2 33	0 19 19.41	1 30 46.3	7.4	7.2	0.48
4	2 4	20 56 18.51	19 6 0.6	6.2	6.0	0.42	18	2 34	0 23 39.10	2 2 16.6	7.4	7.2	0.48
5	2 5	21 1 20.76	18 45 12.4	6.2	6.0	0.42	19	2 34	0 27 58.56	2 33 44.5	7.5	7.2	0.48
6	2 6	21 6 21.61	−18 23 52.8	6.2	6.0	0.42	20	2 35	0 32 17.83	+ 3 5 9.4	7.5	7.3	0.49
7	2 7	21 11 21.06	18 2 2.6	6.2	6.0	0.42	21	2 35	0 36 36.94	3 36 30.5	7.5	7.3	0.49
8	2 8	21 16 19.10	17 39 42.5	6.2	6.1	0.42	22	2 35	0 40 55.94	4 7 47.2	7.6	7.4	0.49
9	2 9	21 21 15.73	17 16 53.3	6.3	6.1	0.42	23	2 36	0 45 14.86	4 38 58.7	7.6	7.4	0.50
10	2 10	21 26 10.96	16 53 35.9	6.3	6.1	0.43	24	2 36	0 49 33.73	5 10 4.4	7.7	7.4	0.50
11	2 11	21 31 4.80	−16 29 51.1	6.3	6.1	0.43	25	2 36	0 53 52.59	+ 5 41 3.6	7.7	7.5	0.50
12	2 12	21 35 57.24	16 5 39.6	6.3	6.1	0.43	26	2 37	0 58 11.47	6 11 55.7	7.8	7.5	0.51
13	2 13	21 40 48.29	15 41 2.4	6.3	6.2	0.43	27	2 37	1 2 30.41	6 42 39.9	7.8	7.6	0.51
14	2 14	21 45 37.96	15 16 0.1	6.4	6.2	0.43	28	2 38	1 6 49.45	7 13 15.4	7.8	7.6	0.51
15	2 15	21 50 26.28	14 50 33.5	6.4	6.2	0.43	29	2 38	1 11 8.62	7 43 41.8	7.9	7.7	0.52
16	2 16	21 55 13.25	−14 24 43.5	6.4	6.2	0.43	Mar. 1	2 38	1 15 27.96	+ 8 13 58.3	7.9	7.7	0.52
17	2 16	21 59 58.91	13 58 30.9	6.4	6.2	0.43	2	2 39	1 19 47.47	8 44 4.1	8.0	7.8	0.52
18	2 17	22 4 43.26	13 31 56.4	6.5	6.3	0.43	3	2 39	1 24 7.18	9 13 58.5	8.0	7.8	0.53
19	2 18	22 9 26.33	13 5 0.8	6.5	6.3	0.43	4	2 39	1 28 27.12	9 43 40.7	8.1	7.9	0.53
20	2 19	22 14 8.15	12 37 45.0	6.5	6.3	0.43	5	2 40	1 32 47.32	10 13 10.1	8.1	7.9	0.54
21	2 19	22 18 48.75	−12 10 9.6	6.6	6.4	0.43	6	2 40	1 37 7.79	+10 42 26.1	8.2	8.0	0.54
22	2 20	22 23 28.15	11 42 15.5	6.6	6.4	0.43	7	2 41	1 41 28.54	11 11 27.9	8.2	8.0	0.54
23	2 21	22 28 6.37	11 14 3.5	6.6	6.4	0.43	8	2 41	1 45 49.61	11 40 14.8	8.3	8.1	0.55
24	2 22	22 32 43.45	10 45 34.2	6.6	6.4	0.44	9	2 41	1 50 11.01	12 8 46.1	8.3	8.1	0.55
25	2 22	22 37 19.42	10 16 48.5	6.6	6.5	0.44	10	2 42	1 54 32.75	12 37 1.0	8.4	8.2	0.56
26	2 23	22 41 54.32	− 9 47 47.2	6.7	6.5	0.44	11	2 42	1 58 54.84	+13 4 58.9	8.5	8.2	0.56
27	2 23	22 46 28.17	9 18 31.1	6.7	6.5	0.44	12	2 43	2 3 17.30	13 32 39.3	8.5	8.3	0.57
28	2 24	22 51 1.02	8 49 0.8	6.7	6.5	0.44	13	2 43	2 7 40.15	14 0 1.3	8.6	8.3	0.57
29	2 25	22 55 32.90	8 19 17.1	6.8	6.6	0.44	14	2 44	2 12 3.38	14 27 4.2	8.6	8.4	0.58
30	2 25	23 0 3.83	7 49 20.9	6.8	6.6	0.44	15	2 44	2 16 27.00	14 53 47.5	8.7	8.4	0.58
31	2 26	23 4 33.86	− 7 19 12.9	6.8	6.6	0.45	16	2 45	2 20 51.03	+15 20 10.6	8.7	8.5	0.59
Feb. 1	2 26	23 9 3.02	6 48 53.8	6.9	6.6	0.45	17	2 45	2 25 15.46	15 46 12.8	8.8	8.5	0.59
2	2 27	23 13 31.35	6 18 24.4	6.9	6.7	0.45	18	2 46	2 29 40.30	16 11 53.3	8.9	8.6	0.60
3	2 27	23 17 58.87	5 47 45.5	6.9	6.7	0.45	19	2 46	2 34 5.56	16 37 11.6	8.9	8.7	0.60
4	2 28	23 22 25.63	5 16 58.0	6.9	6.7	0.45	20	2 46	2 38 31.24	17 2 7.1	9.0	8.7	0.61
5	2 28	23 26 51.66	− 4 46 2.6	7.0	6.8	0.45	21	2 47	2 42 57.33	+17 26 39.2	9.1	8.8	0.62
6	2 29	23 31 16.98	4 14 59.9	7.0	6.8	0.46	22	2 47	2 47 23.84	17 50 47.3	9.1	8.9	0.62
7	2 29	23 35 41.64	3 43 50.8	7.0	6.8	0.46	23	2 48	2 51 50.75	18 14 30.8	9.2	8.9	0.63
8	2 30	23 40 5.68	3 12 36.1	7.1	6.9	0.46	24	2 48	2 56 18.07	18 37 49.1	9.3	9.0	0.63
9	2 30	23 44 29.12	2 41 16.5	7.1	6.9	0.46	25	2 49	3 0 45.79	19 0 41.8	9.4	9.1	0.64
10	2 31	23 48 51.99	− 2 9 52.8	7.1	6.9	0.46	26	2 49	3 5 13.90	+19 23 8.2	9.4	9.2	0.65
11	2 31	23 53 14.33	1 38 25.8	7.2	7.0	0.46	27	2 50	3 9 42.38	19 45 7.7	9.5	9.2	0.65
12	2 31	23 57 36.18	1 6 56.2	7.2	7.0	0.47	28	2 51	3 14 11.22	20 6 39.8	9.6	9.3	0.66
13	2 32	0 1 57.59	0 35 24.6	7.2	7.0	0.47	29	2 51	3 18 40.39	20 27 43.9	9.7	9.4	0.67
14	2 32	0 6 18.58	− 0 3 51.8	7.3	7.1	0.47	30	2 52	3 23 9.87	20 48 19.5	9.7	9.5	0.68
15	2 33	0 10 39.19	+ 0 27 41.4	7.3	7.1	0.47	31	2 52	3 27 39.63	+21 8 26.2	9.8	9.5	0.68
16	2 33	0 14 59.45	+ 0 59 14.3	7.3	7.1	0.48	Apr. 1	2 53	3 32 9.63	+21 28 3.3	9.9	9.6	0.69

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
pr. 1	2 53	3 32 9.63	+21 28 3.3	9.9	9.6	0.69	May 16	3 3	6 39 18.22	+26 41 57.0	16.4	15.9	1.19
2	2 53	3 36 39.84	21 47 10.4	10.0	9.7	0.70	17	3 2	6 42 27.99	26 37 4.5	16.7	16.2	1.21
3	2 54	3 41 10.22	22 5 47.0	10.1	9.8	0.71	18	3 1	6 45 32.84	26 31 48.8	16.9	16.4	1.22
4	2 54	3 45 40.72	22 23 52.6	10.2	9.9	0.71	19	3 0	6 48 32.61	26 26 10.8	17.2	16.7	1.24
5	2 55	3 50 11.30	22 41 26.8	10.3	10.0	0.72	20	2 59	6 51 27.11	26 20 11.5	17.4	16.9	1.26
6	2 56	3 54 41.90	+22 58 29.3	10.3	10.0	0.73	21	2 58	6 54 16.16	+26 13 51.6	17.7	17.2	1.28
7	2 56	3 59 12.46	23 14 59.5	10.4	10.1	0.74	22	2 57	6 56 59.57	26 7 11.8	18.0	17.4	1.30
8	2 57	4 3 42.92	23 30 57.1	10.5	10.2	0.75	23	2 55	6 59 37.14	26 0 13.0	18.2	17.7	1.32
9	2 57	4 8 13.23	23 46 21.8	10.6	10.3	0.75	24	2 54	7 2 8.68	25 52 56.0	18.5	18.0	1.33
10	2 58	4 12 43.30	24 1 13.3	10.7	10.4	0.76	25	2 52	7 4 33.96	25 45 21.8	18.8	18.2	1.35
11	2 58	4 17 13.08	+24 15 31.2	10.8	10.5	0.77	26	2 51	7 6 52.78	+25 37 31.1	19.1	18.5	1.37
12	2 59	4 21 42.50	24 29 15.2	10.9	10.6	0.78	27	2 49	7 9 4.94	25 29 24.9	19.4	18.8	1.39
13	2 59	4 26 11.48	24 42 25.2	11.1	10.7	0.79	28	2 47	7 11 10.21	25 21 4.1	19.7	19.2	1.42
14	3 0	4 30 39.94	24 55 0.9	11.2	10.8	0.80	29	2 45	7 13 8.35	25 12 29.5	20.0	19.5	1.44
15	3 0	4 35 7.80	25 7 2.1	11.3	10.9	0.81	30	2 43	7 14 59.12	25 3 42.0	20.4	19.8	1.46
16	3 1	4 39 34.98	+25 18 28.8	11.4	11.1	0.82	31	2 41	7 16 42.28	+24 54 42.5	20.7	20.1	1.48
17	3 1	4 44 1.39	25 29 20.7	11.5	11.2	0.83	June 1	2 39	7 18 17.58	24 45 31.9	21.0	20.4	1.50
18	3 2	4 48 26.96	25 39 37.8	11.6	11.3	0.84	2	2 36	7 19 44.77	24 36 11.0	21.4	20.7	1.53
19	3 2	4 52 51.59	25 49 20.0	11.7	11.4	0.84	3	2 33	7 21 3.62	24 26 40.7	21.7	21.1	1.55
20	3 3	4 57 15.20	25 58 27.3	11.9	11.5	0.85	4	2 31	7 22 13.89	24 17 1.9	22.1	21.4	1.58
21	3 3	5 1 37.69	+26 6 59.8	12.0	11.6	0.86	5	2 28	7 23 15.34	+24 7 15.3	22.4	21.8	1.60
22	3 4	5 5 58.96	26 14 57.4	12.1	11.8	0.87	6	2 25	7 24 7.72	23 57 21.6	22.8	22.1	1.62
23	3 4	5 10 18.93	26 22 20.1	12.2	11.9	0.88	7	2 21	7 24 50.79	23 47 21.6	23.2	22.5	1.65
24	3 5	5 14 37.49	26 29 8.0	12.4	12.0	0.89	8	2 18	7 25 24.34	23 37 16.1	23.5	22.9	1.67
25	3 5	5 18 54.54	26 35 21.3	12.5	12.2	0.91	9	2 14	7 25 48.16	23 27 5.7	23.9	23.2	1.69
26	3 5	5 23 9.96	+26 41 0.1	12.7	12.3	0.92	10	2 11	7 26 2.06	+23 16 50.9	24.3	23.6	1.72
27	3 5	5 27 23.66	26 46 4.6	12.8	12.4	0.93	11	2 7	7 26 5.89	23 6 32.3	24.7	24.0	1.74
28	3 6	5 31 35.53	26 50 35.1	13.0	12.6	0.94	12	2 3	7 25 59.49	22 56 10.5	25.1	24.3	1.77
29	3 6	5 35 45.44	26 54 31.7	13.1	12.7	0.95	13	1 59	7 25 42.77	22 45 46.1	25.4	24.7	1.79
30	3 6	5 39 53.26	26 57 54.7	13.3	12.9	0.96	14	1 54	7 25 15.65	22 35 19.3	25.8	25.1	1.82
ay 1	3 6	5 43 58.86	+27 0 44.5	13.4	13.1	0.98	15	1 50	7 24 38.10	+22 24 50.5	26.2	25.4	1.84
2	3 6	5 48 2.11	27 3 1.3	13.6	13.2	0.99	16	1 45	7 23 50.15	22 14 20.1	26.5	25.8	1.86
3	3 6	5 52 2.87	27 4 45.5	13.8	13.4	1.00	17	1 40	7 22 51.89	22 3 48.3	26.9	26.1	1.88
4	3 6	5 56 0.99	27 5 57.7	14.0	13.6	1.01	18	1 35	7 21 43.44	21 53 15.3	27.3	26.5	1.90
5	3 6	5 59 56.35	27 6 38.2	14.1	13.7	1.03	19	1 30	7 20 24.99	21 42 41.4	27.6	26.8	1.93
6	3 6	6 3 48.81	+27 6 47.6	14.3	13.9	1.04	20	1 24	7 18 56.81	+21 32 6.9	27.9	27.1	1.95
7	3 6	6 7 38.20	27 6 26.3	14.5	14.1	1.05	21	1 19	7 17 19.20	21 21 32.1	28.2	27.4	1.97
8	3 6	6 11 24.35	27 5 34.9	14.7	14.3	1.07	22	1 13	7 15 32.55	21 10 57.4	28.5	27.6	1.99
9	3 6	6 15 7.13	27 4 14.0	14.9	14.5	1.08	23	1 7	7 13 37.33	21 0 23.2	28.8	28.0	2.01
10	3 6	6 18 46.38	27 2 24.3	15.1	14.7	1.10	24	1 1	7 11 34.06	20 49 50.1	29.1	28.3	2.02
11	3 5	6 22 21.93	+27 0 6.3	15.3	14.9	1.11	25	0 55	7 9 23.32	+20 39 18.6	29.3	28.5	2.03
12	3 5	6 25 53.60	26 57 20.7	15.5	15.1	1.13	26	0 49	7 7 5.77	20 28 49.6	29.6	28.7	2.05
13	3 4	6 29 21.23	26 54 8.2	15.7	15.3	1.14	27	0 43	7 4 42.15	20 18 23.9	29.8	28.9	2.06
14	3 4	6 32 44.65	26 50 29.6	16.0	15.5	1.16	28	0 36	7 2 13.25	20 8 2.6	30.0	29.1	2.07
15	3 3	6 36 3.71	26 46 25.6	16.2	15.7	1.17	29	0 30	6 59 39.91	19 57 46.8	30.1	29.2	2.07
16	3 3	6 39 18.22	+26 41 57.0	16.4	15.9	1.19	30	0 23	6 57 3.03	+19 47 37.8	30.2	29.3	2.08
17	3 2	6 42 27.99	+26 37 4.5	16.7	16.2	1.21	July 1	0 17	6 54 23.54	+19 37 37.2	30.3	29.4	2.08

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
July 1	0 17	6 54 23.54	+19 37 37.2	30.3	29.4	2.08	Aug. 16	21 7	6 49 16.62	+18 6 28.6	17.4	16.9	1.19
2	0 10	6 51 42.39	19 27 46.5	30.3	29.5	2.08	17	21 6	6 52 5.42	18 8 10.8	17.1	16.6	1.17
3	0 3	6 49 0.57	19 18 7.3	30.4	29.5	2.08	18	21 5	6 54 58.84	18 9 40.4	16.9	16.4	1.15
3	23 57	6 46 19.08	19 8 41.4	30.3	29.5	2.08	19	21 4	6 57 56.69	18 10 56.4	16.7	16.2	1.14
4	23 50	6 43 38.89	18 59 30.8	30.3	29.4	2.08	20	21 3	7 0 58.80	18 11 57.9	16.4	15.9	1.12
5	23 44	6 41 0.97	+18 50 37.3	30.2	29.3	2.07	21	21 2	7 4 5.01	+18 12 43.9	16.2	15.7	1.11
6	23 37	6 38 26.26	18 42 2.7	30.1	29.2	2.06	22	21 1	7 7 15.15	18 13 13.3	16.0	15.5	1.09
7	23 31	6 35 55.65	18 33 48.6	30.0	29.1	2.05	23	21 0	7 10 29.07	18 13 25.0	15.8	15.3	1.08
8	23 24	6 33 30.01	18 25 56.8	29.8	28.9	2.04	24	21 0	7 13 46.62	18 13 18.3	15.6	15.1	1.06
9	23 18	6 31 10.13	18 18 29.0	29.6	28.7	2.02	25	20 59	7 17 7.64	18 12 52.4	15.4	14.9	1.05
10	23 12	6 28 56.77	+18 11 26.8	29.4	28.5	2.00	26	20 59	7 20 31.99	+18 12 6.6	15.1	14.7	1.03
11	23 6	6 26 50.61	18 4 51.5	29.1	28.3	1.98	27	20 58	7 23 59.54	18 11 0.1	14.9	14.5	1.02
12	23 0	6 24 52.24	17 58 44.0	28.9	28.0	1.96	28	20 58	7 27 30.14	18 9 32.2	14.7	14.3	1.01
13	22 54	6 23 2.19	17 53 5.0	28.6	27.7	1.94	29	20 57	7 31 3.66	18 7 42.2	14.6	14.2	1.00
14	22 49	6 21 20.93	17 47 55.3	28.3	27.5	1.92	30	20 57	7 34 39.98	18 5 29.4	14.4	14.0	0.98
15	22 43	6 19 48.86	+17 43 15.3	28.0	27.2	1.90	31	20 57	7 38 18.97	+18 2 53.3	14.2	13.8	0.97
16	22 38	6 18 26.29	17 39 5.3	27.7	26.9	1.88	Sept. 1	20 56	7 42 0.53	17 59 53.3	14.0	13.6	0.96
17	22 33	6 17 13.46	17 35 25.2	27.3	26.5	1.86	2	20 56	7 45 44.54	17 56 29.0	13.9	13.5	0.95
18	22 28	6 16 10.53	17 32 14.7	27.0	26.2	1.84	3	20 56	7 49 30.88	17 52 39.8	13.7	13.3	0.93
19	22 23	6 15 17.61	17 29 33.3	26.6	25.9	1.81	4	20 56	7 53 19.46	17 48 25.2	13.6	13.2	0.92
20	22 18	6 14 34.74	+17 27 20.4	26.2	25.5	1.78	5	20 56	7 57 10.17	+17 43 44.8	13.4	13.0	0.91
21	22 14	6 14 1.92	17 25 35.1	25.9	25.1	1.76	6	20 56	8 1 2.92	17 38 38.2	13.2	12.8	0.90
22	22 9	6 13 39.11	17 24 16.6	25.5	24.8	1.73	7	20 56	8 4 57.62	17 33 5.0	13.1	12.7	0.89
23	22 5	6 13 26.20	17 23 23.7	25.1	24.4	1.71	8	20 56	8 8 54.18	17 27 4.8	12.9	12.6	0.88
24	22 1	6 13 23.08	17 22 55.3	24.8	24.0	1.68	9	20 56	8 12 52.52	17 20 37.3	12.8	12.4	0.87
25	21 58	6 13 29.58	+17 22 50.0	24.4	23.7	1.66	10	20 56	8 16 52.55	+17 13 42.2	12.6	12.3	0.86
26	21 54	6 13 45.54	17 23 6.5	24.0	23.3	1.63	11	20 56	8 20 54.19	17 6 19.3	12.5	12.1	0.85
27	21 50	6 14 10.78	17 23 43.3	23.6	23.0	1.61	12	20 56	8 24 57.34	16 58 28.4	12.4	12.0	0.84
28	21 47	6 14 45.08	17 24 38.8	23.3	22.6	1.58	13	20 56	8 29 1.94	16 50 9.3	12.2	11.9	0.83
29	21 44	6 15 28.22	17 25 51.6	22.9	22.3	1.56	14	20 56	8 33 7.91	16 41 21.9	12.1	11.8	0.82
30	21 41	6 16 19.97	+17 27 20.0	22.6	21.9	1.53	15	20 56	8 37 15.16	+16 32 6.1	12.0	11.6	0.81
31	21 38	6 17 20.10	17 29 2.5	22.2	21.6	1.51	16	20 57	8 41 23.63	16 22 21.8	11.9	11.5	0.80
Aug. 1	21 35	6 18 28.37	17 30 57.3	21.9	21.2	1.49	17	20 57	8 45 33.22	16 12 9.0	11.7	11.4	0.79
2	21 32	6 19 44.55	17 33 2.8	21.5	20.9	1.46	18	20 57	8 49 43.87	16 1 27.7	11.6	11.3	0.78
3	21 30	6 21 8.40	17 35 17.4	21.2	20.6	1.44	19	20 57	8 53 55.51	15 50 18.0	11.5	11.2	0.77
4	21 27	6 22 39.69	+17 37 39.6	20.9	20.3	1.42	20	20 58	8 58 8.07	+15 38 40.0	11.4	11.1	0.77
5	21 25	6 24 18.20	17 40 7.8	20.5	19.9	1.40	21	20 58	9 2 21.49	15 26 33.8	11.3	11.0	0.76
6	21 23	6 26 3.69	17 42 40.3	20.2	19.6	1.37	22	20 58	9 6 35.70	15 13 59.4	11.2	10.9	0.75
7	21 21	6 27 55.94	17 45 15.5	19.9	19.3	1.35	23	20 59	9 10 50.65	15 0 57.2	11.1	10.8	0.74
8	21 19	6 29 54.74	17 47 52.0	19.6	19.0	1.33	24	20 59	9 15 6.26	14 47 27.3	11.0	10.7	0.73
9	21 17	6 31 59.87	+17 50 28.1	19.3	18.7	1.31	25	20 59	9 19 22.49	+14 33 29.9	10.9	10.6	0.73
10	21 15	6 34 11.14	17 53 2.3	19.0	18.5	1.29	26	21 0	9 23 39.29	14 19 5.2	10.8	10.5	0.72
11	21 14	6 36 28.35	17 55 33.1	18.7	18.2	1.27	27	21 0	9 27 56.61	14 4 13.5	10.7	10.4	0.71
12	21 12	6 38 51.30	17 57 59.2	18.4	17.9	1.26	28	21 0	9 32 14.40	13 48 55.1	10.6	10.3	0.70
13	21 11	6 41 19.78	18 0 19.2	18.2	17.6	1.24	29	21 1	9 36 32.61	13 33 10.3	10.5	10.2	0.70
14	21 9	6 43 53.62	+18 2 31.6	17.9	17.4	1.22	30	21 1	9 40 51.21	+13 16 59.4	10.4	10.1	0.69
15	*21 8*	*6 46 32.63*	+18 4 35.1	17.6	17.1	1.20	Oct. 1	21 1	9 45 10.17	+13 0 22.7	10.3	10.0	0.68

FOR TRANSIT AT WASHINGTON.

ate.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
t. 1	21 1	9 45 10.17	+13 0 22.7	10.3	10.0	0.68	Nov. 16	21 22	13 7 5.08	− 5 6 35.7	7.5	7.3	0.49
2	21 2	9 49 29.45	12 43 20.5	10.2	9.9	0.68	17	21 22	13 11 35.88	5 33 21.3	7.4	7.2	0.48
3	21 2	9 53 49.01	12 25 53.2	10.1	9.8	0.67	18	21 23	13 16 7.34	6 0 3.7	7.4	7.2	0.48
4	21 2	9 58 8.84	12 8 1.2	10.0	9.7	0.66	19	21 24	13 20 39.50	6 26 42.0	7.4	7.2	0.48
5	21 3	10 2 28.90	11 49 44.8	9.9	9.7	0.66	20	21 24	13 25 12.37	6 53 15.5	7.3	7.1	0.48
6	21 3	10 6 49.19	+11 31 4.4	9.9	9.6	0.65	21	21 25	13 29 45.98	− 7 19 43.4	7.3	7.1	0.48
7	21 4	10 11 9.67	11 12 0.4	9.8	9.5	0.65	22	21 25	13 34 20.35	7 46 5.0	7.3	7.1	0.48
8	21 4	10 15 30.34	10 52 33.3	9.7	9.4	0.64	23	21 26	13 38 55.51	8 12 19.4	7.2	7.0	0.47
9	21 4	10 19 51.18	10 32 43.4	9.6	9.3	0.63	24	21 27	13 43 31.48	8 38 25.8	7.2	7.0	0.47
10	21 5	10 24 12.18	10 12 31.2	9.5	9.3	0.63	25	21 27	13 48 8.29	9 4 23.5	7.1	6.9	0.47
11	21 5	10 28 33.32	+ 9 51 57.1	9.5	9.2	0.62	26	21 28	13 52 45.95	− 9 30 11.5	7.1	6.9	0.47
12	21 6	10 32 54.60	9 31 1.7	9.4	9.1	0.62	27	21 29	13 57 24.50	9 55 49.1	7.1	6.9	0.47
13	21 6	10 37 16.02	9 9 45.5	9.3	9.1	0.61	28	21 29	14 2 3.96	10 21 15.6	7.1	6.9	0.46
14	21 6	10 41 37.56	8 48 9.0	9.2	9.0	0.61	29	21 30	14 6 44.35	10 46 30.3	7.0	6.8	0.46
15	21 7	10 45 59.20	8 26 12.8	9.2	8.9	0.60	30	21 31	14 11 25.69	11 11 32.3	7.0	6.8	0.46
16	21 7	10 50 20.94	+ 8 3 57.3	9.1	8.8	0.60	Dec. 1	21 32	14 16 8.02	−11 36 20.8	7.0	6.8	0.46
17	21 8	10 54 42.79	7 41 23.3	9.0	8.8	0.59	2	21 32	14 20 51.35	12 0 55.0	6.9	6.7	0.46
18	21 8	10 59 4.74	7 18 31.3	9.0	8.7	0.59	3	21 33	14 25 35.71	12 25 14.2	6.9	6.7	0.46
19	21 9	11 3 26.79	6 55 21.9	8.9	8.7	0.58	4	21 34	14 30 21.12	12 49 17.5	6.9	6.7	0.46
20	21 9	11 7 48.94	6 31 55.7	8.9	8.6	0.58	5	21 35	14 35 7.59	13 13 4.2	6.8	6.6	0.45
21	21 9	11 12 11.18	+ 6 8 13.4	8.8	8.5	0.57	6	21 36	14 39 55.16	−13 36 33.5	6.8	6.6	0.45
22	21 10	11 16 33.53	5 44 15.5	8.7	8.5	0.57	7	21 37	14 44 43.85	13 59 44.7	6.8	6.6	0.45
23	21 10	11 20 55.98	5 20 2.8	8.7	8.4	0.56	8	21 37	14 49 33.67	14 22 36.8	6.7	6.5	0.45
24	21 11	11 25 18.54	4 55 35.8	8.6	8.4	0.56	9	21 38	14 54 24.65	14 45 9.1	6.7	6.5	0.45
25	21 11	11 29 41.23	4 30 55.2	8.6	8.3	0.56	10	21 39	14 59 16.79	15 7 20.8	6.7	6.5	0.45
26	21 12	11 34 4.04	+ 4 6 1.7	8.5	8.2	0.55	11	21 40	15 4 10.10	−15 29 11.1	6.6	6.5	0.45
27	21 12	11 38 26.99	3 40 56.0	8.4	8.2	0.55	12	21 41	15 9 4.60	15 50 39.2	6.6	6.4	0.45
28	21 12	11 42 50.09	3 15 38.7	8.4	8.1	0.54	13	21 42	15 14 0.29	16 11 44.3	6.6	6.4	0.44
29	21 13	11 47 13.35	2 50 10.5	8.3	8.1	0.54	14	21 43	15 18 57.19	16 32 25.6	6.6	6.4	0.44
30	21 13	11 51 36.79	2 24 32.1	8.3	8.0	0.54	15	21 44	15 23 55.30	16 52 42.4	6.5	6.4	0.44
31	21 14	11 56 0.43	+ 1 58 44.1	8.2	8.0	0.53	16	21 45	15 28 54.61	−17 12 33.8	6.5	6.3	0.44
ov. 1	21 14	12 0 24.29	1 32 47.0	8.2	7.9	0.53	17	21 46	15 33 55.12	17 31 59.1	6.5	6.3	0.44
2	21 15	12 4 48.38	1 6 41.7	8.1	7.9	0.53	18	21 47	15 38 56.84	17 50 57.4	6.5	6.3	0.44
3	21 15	12 9 12.73	0 40 28.8	8.1	7.8	0.52	19	21 49	15 43 59.76	18 9 28.0	6.4	6.3	0.44
4	21 16	12 13 37.37	+ 0 14 9.1	8.0	7.8	0.52	20	21 50	15 49 3.87	18 27 30.2	6.4	6.2	0.44
5	21 16	12 18 2.32	− 0 12 16.8	8.0	7.7	0.52	21	21 51	15 54 9.16	−18 45 3.2	6.4	6.2	0.44
6	21 17	12 22 27.60	0 38 48.3	7.9	7.7	0.51	22	21 52	15 59 15.62	19 2 6.2	6.4	6.2	0.44
7	21 17	12 26 53.25	1 5 24.8	7.9	7.7	0.51	23	21 53	16 4 23.23	19 18 38.6	6.3	6.2	0.44
8	21 18	12 31 19.30	1 32 5.6	7.8	7.6	0.51	24	21 54	16 9 31.97	19 34 39.7	6.3	6.1	0.44
9	21 18	12 35 45.78	1 58 49.8	7.8	7.6	0.51	25	21 56	16 14 41.81	19 50 8.7	6.3	6.1	0.44
10	21 19	12 40 12.70	− 2 25 36.8	7.7	7.5	0.50	26	21 57	16 19 52.74	−20 5 4.9	6.3	6.1	0.43
11	21 19	12 44 40.08	2 52 25.9	7.7	7.5	0.50	27	21 58	16 25 4.73	20 19 27.7	6.3	6.1	0.43
12	21 20	12 49 7.96	3 19 16.2	7.7	7.4	0.50	28	21 59	16 30 17.76	20 33 16.6	6.2	6.1	0.43
13	21 20	12 53 36.38	3 46 7.1	7.6	7.4	0.49	29	22 1	16 35 31.80	20 46 30.9	6.2	6.0	0.43
14	21 21	12 58 5.35	4 12 57.8	7.6	7.4	0.49	30	22 2	16 40 46.82	20 59 9.9	6.2	6.0	0.43
15	21 21	13 2 34.91	− 4 39 47.6	7.5	7.3	0.49	31	22 3	16 46 2.78	−21 11 13.0	6.2	6.0	0.43
16	21 22	13 7 5.08	− 5 6 35.7	7.5	7.3	0.49	32	22 5	16 51 19.66	−21 22 39.8	6.2	6.0	0.43

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Jan. 0	15 34	10 12 47.73	+14 49 57.2	10.6	6.1	0.42	Feb. 15	11 47	9 26 11.58	+19 51 4.0	12.9	7.4	0.53
1	15 30	10 12 48.38	14 52 23.4	10.7	6.2	0.42	16	11 41	9 24 38.64	19 57 26.5	12.9	7.4	0.53
2	15 26	10 12 45.99	14 55 6.0	10.8	6.2	0.43	17	11 36	9 23 6.77	20 3 35.0	12.9	7.4	0.53
3	15 22	10 12 40.54	14 58 5.5	10.9	6.2	0.43	18	11 30	9 21 36.12	20 9 28.9	12.8	7.4	0.52
4	15 18	10 12 32.01	15 1 21.7	11.0	6.3	0.43	19	11 25	9 20 6.87	20 15 7.9	12.8	7.3	0.52
5	15 14	10 12 20.36	+15 4 54.3	11.1	6.4	0.44	20	11 20	9 18 39.18	+20 20 31.5	12.8	7.3	0.52
6	15 10	10 12 5.58	15 8 43.3	11.2	6.4	0.44	21	11 14	9 17 13.18	20 25 39.4	12.7	7.3	0.52
7	15 6	10 11 47.65	15 12 48.6	11.3	6.5	0.44	22	11 9	9 15 49.01	20 30 31.3	12.6	7.2	0.52
8	15 1	10 11 26.55	15 17 10.0	11.4	6.5	0.45	23	11 4	9 14 26.81	20 35 7.0	12.6	7.2	0.52
9	14 57	10 11 2.30	15 21 47.3	11.4	6.6	0.45	24	10 58	9 13 6.73	20 39 26.3	12.5	7.2	0.51
10	14 52	10 10 34.87	+15 26 40.3	11.5	6.6	0.45	25	10 53	9 11 48.88	+20 43 29.2	12.5	7.1	0.51
11	14 48	10 10 4.28	15 31 48.8	11.6	6.6	0.46	26	10 48	9 10 33.36	20 47 15.4	12.4	7.1	0.51
12	14 44	10 9 30.54	15 37 12.3	11.7	6.7	0.46	27	10 43	9 9 20.32	20 50 44.8	12.3	7.1	0.51
13	14 39	10 8 53.64	15 42 50.5	11.8	6.7	0.46	28	10 38	9 8 9.85	20 53 57.5	12.3	7.0	0.51
14	14 34	10 8 13.60	15 48 43.1	11.8	6.8	0.47	29	10 33	9 7 2.05	20 56 53.4	12.2	7.0	0.50
15	14 30	10 7 30.44	+15 54 49.6	11.9	6.8	0.47	Mar. 1	10 28	9 5 57.01	+20 59 32.4	12.1	6.9	0.50
16	14 25	10 6 44.18	16 1 9.4	12.0	6.9	0.47	2	10 23	9 4 54.83	21 1 54.8	12.0	6.9	0.50
17	14 20	10 5 54.84	16 7 42.2	12.1	6.9	0.47	3	10 18	9 3 55.58	21 4 0.4	12.0	6.8	0.49
18	14 16	10 5 2.47	16 14 27.3	12.2	7.0	0.49	4	10 13	9 2 59.34	21 5 49.5	11.9	6.8	0.49
19	14 11	10 4 7.11	16 21 24.3	12.2	7.0	0.49	5	10 8	9 2 6.13	21 7 22.2	11.8	6.8	0.49
20	14 6	10 3 8.77	+16 28 32.5	12.3	7.1	0.49	6	10 3	9 1 16.03	+21 8 38.7	11.7	6.7	0.49
21	14 1	10 2 7.54	16 35 51.2	12.4	7.1	0.50	7	9 58	9 0 29.08	21 9 39.2	11.6	6.7	0.47
22	13 56	10 1 3.47	16 43 19.8	12.4	7.1	0.50	8	9 54	8 59 45.30	21 10 24.1	11.6	6.6	0.47
23	13 51	9 59 56.63	16 50 57.4	12.5	7.2	0.50	9	9 49	8 59 4.71	21 10 53.5	11.5	6.6	0.47
24	13 46	9 58 47.10	16 58 43.3	12.6	7.2	0.51	10	9 45	8 58 27.33	21 11 7.7	11.4	6.5	0.46
25	13 41	9 57 34.93	+17 6 36.7	12.6	7.2	0.51	11	9 40	8 57 53.17	+21 11 7.0	11.3	6.5	0.46
26	13 35	9 56 20.24	17 14 36.6	12.7	7.3	0.51	12	9 36	8 57 22.23	21 10 51.8	11.2	6.4	0.46
27	13 30	9 55 3.12	17 22 42.1	12.7	7.3	0.51	13	9 31	8 56 54.50	21 10 22.4	11.1	6.4	0.45
28	13 25	9 53 43.68	17 30 52.2	12.8	7.3	0.51	14	9 27	8 56 29.96	21 9 38.8	11.0	6.3	0.45
29	13 20	9 52 22.04	17 39 6.1	12.8	7.4	0.52	15	9 23	8 56 8.62	21 8 41.6	10.9	6.3	0.45
30	13 14	9 50 58.33	+17 47 22.5	12.9	7.4	0.52	16	9 18	8 55 50.44	+21 7 31.0	10.8	6.2	0.44
31	13 9	9 49 32.69	17 55 40.4	12.9	7.4	0.52	17	9 14	8 55 35.39	21 6 7.3	10.8	6.2	0.44
Feb. 1	13 4	9 48 5.26	18 3 58.9	12.9	7.4	0.52	18	9 10	8 55 23.46	21 4 30.8	10.7	6.1	0.44
2	12 58	9 46 36.21	18 12 16.7	13.0	7.4	0.52	19	9 6	8 55 14.61	21 2 41.9	10.6	6.1	0.43
3	12 53	9 45 5.71	18 20 32.7	13.0	7.4	0.52	20	9 2	8 55 8.80	21 0 40.8	10.5	6.0	0.43
4	12 47	9 43 33.93	+18 28 45.6	13.0	7.5	0.53	21	8 58	8 55 6.00	+20 58 27.7	10.4	6.0	0.43
5	12 42	9 42 1.02	18 36 54.6	13.0	7.5	0.53	22	8 54	8 55 6.17	20 56 3.0	10.3	5.9	0.42
6	12 36	9 40 27.19	18 44 58.5	13.0	7.5	0.53	23	8 50	8 55 9.28	20 53 26.9	10.2	5.8	0.42
7	12 31	9 38 52.62	18 52 56.3	13.0	7.5	0.53	24	8 46	8 55 15.28	20 50 39.6	10.1	5.8	0.42
8	12 25	9 37 17.49	19 0 46.9	13.0	7.5	0.53	25	8 43	8 55 24.13	20 47 41.1	10.0	5.8	0.41
9	12 20	9 35 41.99	+19 8 29.3	13.0	7.5	0.53	26	8 39	8 55 35.80	+20 44 31.8	10.0	5.7	0.41
10	12 14	9 34 6.30	19 16 2.5	13.0	7.5	0.53	27	8 35	8 55 50.25	20 41 11.8	9.9	5.7	0.41
11	12 9	9 32 30.62	19 23 25.8	13.0	7.5	0.53	28	8 32	8 56 7.43	20 37 41.4	9.8	5.6	0.40
12	12 3	9 30 55.13	19 30 38.3	13.0	7.5	0.53	29	8 28	8 56 27.30	20 34 0.5	9.7	5.6	0.40
13	11 58	9 29 20.00	19 37 39.3	13.0	7.5	0.53	30	8 24	8 56 49.82	20 30 9.4	9.6	5.5	0.40
14	11 52	9 27 45.43	+19 44 28.1	13.0	7.4	0.53	31	8 21	8 57 14.96	+20 26 8.4	9.5	5.5	0.39
15	*11 47*	*9 26 11.58*	+19 51 4.0	12.9	7.4	0.53	Apr. 1	8 18	8 57 42.66	+20 21 57.5	9.5	5.4	0.39

Stellar magnitude at opposition, in February, 1916, −1.0.

FOR TRANSIT AT WASHINGTON.

ate.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
pr. 1	8 18	8 57 42.66	+20 21 57.5	9.5	5.4	0.39	May 17	6 11	9 51 49.76	+14 42 45.5	6.6	3.8	0.26
2	8 14	8 58 12.88	20 17 36.8	9.4	5.4	0.39	18	6 8	9 53 29.13	14 32 36.6	6.6	3.8	0.26
3	8 11	8 58 45.57	20 13 6.5	9.3	5.3	0.38	19	6 6	9 55 9.26	14 22 21.6	6.6	3.8	0.26
4	8 7	8 59 20.67	20 8 26.8	9.2	5.3	0.38	20	6 4	9 56 50.14	14 12 0.4	6.5	3.7	0.26
5	8 4	8 59 58.15	20 3 37.8	9.1	5.2	0.38	21	6 2	9 58 31.73	14 1 33.0	6.5	3.7	0.26
6	8 1	9 0 37.95	+19 58 39.6	9.1	5.2	0.37	22	5 59	10 0 14.05	+13 50 59.5	6.4	3.7	0.25
7	7 58	9 1 20.02	19 53 32.4	9.0	5.2	0.37	23	5 57	10 1 57.08	13 40 19.9	6.4	3.7	0.25
8	7 54	9 2 4.30	19 48 16.3	8.9	5.1	0.37	24	5 55	10 3 40.79	13 29 34.2	6.4	3.6	0.25
9	7 51	9 2 50.75	19 42 51.7	8.8	5.1	0.36	25	5 53	10 5 25.18	13 18 42.4	6.3	3.6	0.25
10	7 48	9 3 39.31	19 37 18.2	8.8	5.0	0.36	26	5 50	10 7 10.22	13 7 44.4	6.3	3.6	0.25
11	7 45	9 4 29.93	+19 31 36.4	8.7	5.0	0.36	27	5 48	10 8 55.92	+12 56 40.5	6.2	3.6	0.25
12	7 42	9 5 22.55	19 25 46.1	8.6	4.9	0.35	28	5 46	10 10 42.26	12 45 30.6	6.2	3.6	0.25
13	7 39	9 6 17.13	19 19 47.7	8.6	4.9	0.35	29	5 44	10 12 29.21	12 34 14.8	6.2	3.5	0.24
14	7 36	9 7 13.61	19 13 41.1	8.5	4.9	0.35	30	5 42	10 14 16.77	12 22 52.9	6.1	3.5	0.24
15	7 33	9 8 11.95	19 7 26.5	8.4	4.8	0.35	31	5 40	10 16 4.93	12 11 25.3	6.1	3.5	0.24
16	7 30	9 9 12.09	+19 1 3.9	8.3	4.8	0.33	June 1	5 38	10 17 53.67	+11 59 52.0	6.1	3.5	0.24
17	7 27	9 10 13.99	18 54 33.6	8.3	4.7	0.33	2	5 36	10 19 42.99	11 48 13.1	6.0	3.5	0.24
18	7 24	9 11 17.60	18 47 55.5	8.2	4.7	0.33	3	5 33	10 21 32.86	11 36 28.3	6.0	3.4	0.24
19	7 21	9 12 22.89	18 41 9.8	8.1	4.7	0.33	4	5 31	10 23 23.27	11 24 37.9	6.0	3.4	0.24
20	7 18	9 13 29.82	18 34 16.5	8.1	4.6	0.32	5	5 29	10 25 14.21	11 12 42.1	5.9	3.4	0.23
21	7 16	9 14 38.33	+18 27 15.5	8.0	4.6	0.32	6	5 27	10 27 5.68	+11 0 40.9	5.9	3.4	0.23
22	7 13	9 15 48.38	18 20 7.0	8.0	4.6	0.32	7	5 25	10 28 57.65	10 48 34.2	5.9	3.4	0.23
23	7 10	9 16 59.95	18 12 51.1	7.9	4.5	0.31	8	5 23	10 30 50.12	10 36 22.3	5.8	3.3	0.23
24	7 8	9 18 13.01	18 5 27.7	7.8	4.5	0.31	9	5 21	10 32 43.06	10 24 5.1	5.8	3.3	0.23
25	7 5	9 19 27.52	17 57 56.9	7.8	4.4	0.31	10	5 19	10 34 36.47	10 11 42.8	5.8	3.3	0.23
26	7 2	9 20 43.44	+17 50 18.6	7.7	4.4	0.31	11	5 17	10 36 30.33	+ 9 59 15.5	5.7	3.3	0.23
27	6 59	9 22 0.74	17 42 33.0	7.6	4.4	0.30	12	5 15	10 38 24.65	9 46 43.1	5.7	3.3	0.23
28	6 57	9 23 19.41	17 34 40.1	7.6	4.4	0.30	13	5 13	10 40 19.41	9 34 5.8	5.7	3.3	0.22
29	6 54	9 24 39.40	17 26 39.9	7.5	4.3	0.30	14	5 11	10 42 14.59	9 21 23.7	5.6	3.2	0.22
30	6 52	9 26 0.67	17 18 32.4	7.5	4.3	0.30	15	5 9	10 44 10.20	9 8 36.6	5.6	3.2	0.22
ay 1	6 49	9 27 23.20	+17 10 17.7	7.4	4.3	0.30	16	5 7	10 46 6.23	+ 8 55 44.9	5.6	3.2	0.22
2	6 47	9 28 46.95	17 1 55.9	7.4	4.2	0.29	17	5 5	10 48 2.67	8 42 48.5	5.6	3.2	0.22
3	6 44	9 30 11.89	16 53 26.8	7.3	4.2	0.29	18	5 3	10 49 59.52	8 29 47.4	5.5	3.2	0.22
4	6 42	9 31 38.00	16 44 50.7	7.3	4.2	0.29	19	5 1	10 51 56.75	8 16 41.7	5.5	3.1	0.22
5	6 39	9 33 5.24	16 36 7.6	7.2	4.1	0.29	20	4 59	10 53 54.40	8 3 31.3	5.5	3.1	0.22
6	6 37	9 34 33.59	+16 27 17.6	7.2	4.1	0.28	21	4 57	10 55 52.44	+ 7 50 16.5	5.5	3.1	0.22
7	6 34	9 36 3.00	16 18 20.7	7.1	4.1	0.28	22	4 55	10 57 50.88	7 36 57.1	5.4	3.1	0.21
8	6 32	9 37 33.46	16 9 16.9	7.0	4.0	0.28	23	4 53	10 59 49.72	7 23 33.2	5.4	3.1	0.21
9	6 29	9 39 4.93	16 0 6.4	7.0	4.0	0.28	24	4 51	11 1 48.95	7 10 5.1	5.4	3.1	0.21
10	6 27	9 40 37.38	15 50 49.0	7.0	4.0	0.28	25	4 49	11 3 48.57	6 56 32.7	5.4	3.1	0.21
11	6 24	9 42 10.79	+15 41 25.1	6.9	4.0	0.28	26	4 47	11 5 48.59	+ 6 42 55.8	5.3	3.1	0.21
12	6 22	9 43 45.11	15 31 54.6	6.9	3.9	0.27	27	4 45	11 7 48.97	6 29 14.8	5.3	3.0	0.21
13	6 20	9 45 20.34	15 22 17.6	6.8	3.9	0.27	28	4 43	11 9 49.75	6 15 29.7	5.3	3.0	0.21
14	6 18	9 46 56.45	15 12 34.2	6.8	3.9	0.27	29	4 41	11 11 50.89	6 1 40.6	5.3	3.0	0.21
15	6 15	9 48 33.40	15 2 44.3	6.7	3.8	0.27	30	4 39	11 13 52.42	5 47 47.4	5.2	3.0	0.21
16	6 13	9 50 11.18	+14 52 48.0	6.7	3.8	0.27	July 1	4 38	11 15 54.32	+ 5 33 50.3	5.2	3.0	0.21
17	6 11	9 51 49.76	+14 42 45.5	6.6	3.8	0.26	2	4 36	11 17 56.59	+ 5 19 49.5	5.2	3.0	0.21

Stellar magnitude at opposition, in February, 1916, —1.0.

JUPITER, 1916.

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Polar Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Polar Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Jan. 1	4 53	23 33 48.83	− 4 11 22.6	1.7	18.2	1.30	Aug. 16	16 32	2 13 55.30	+11 59 28.8	1.9	20.7	1.50
2	4 50	23 34 20.83	4 7 43.0	1.7	18.1	1.29	17	16 28	2 14 1.34	11 59 45.4	1.9	20.8	1.51
3	4 46	23 34 53.34	4 4 0.3	1.7	18.1	1.29	18	16 24	2 14 6.63	11 59 58.1	1.9	20.9	1.51
4	4 43	23 35 26.37	4 0 14.2	1.7	18.0	1.29	19	16 21	2 14 11.16	12 0 7.0	2.0	20.9	1.51
5	4 39	23 35 59.90	3 56 24.9	1.7	18.0	1.28	20	16 17	2 14 14.93	12 0 11.9	2.0	21.0	1.52
6	4 36	23 36 33.92	− 3 52 32.5	1.7	17.9	1.28	21	16 13	2 14 17.95	+12 0 13.0	2.0	21.1	1.52
7	4 33	23 37 8.42	3 48 37.0	1.7	17.9	1.28	22	16 9	2 14 20.20	12 0 10.0	2.0	21.1	1.53
8	4 29	23 37 43.41	3 44 38.5	1.7	17.8	1.27	23	16 5	2 14 21.67	12 0 3.2	2.0	21.2	1.53
9	4 26	23 38 18.86	3 40 37.1	1.7	17.8	1.27	24	16 1	2 14 22.38	11 59 52.4	2.0	21.3	1.54
10	4 23	23 38 54.77	3 36 32.8	1.7	17.8	1.26	25	15 57	2 14 22.31	11 59 37.7	2.0	21.3	1.54
11	4 19	23 39 31.14	− 3 32 25.5	1.7	17.7	1.26	26	15 53	2 14 21.46	+11 59 19.0	2.0	21.4	1.55
12	4 16	23 40 7.94	3 28 15.5	1.6	17.7	1.26	27	15 49	2 14 19.85	11 58 56.6	2.0	21.5	1.55
13	4 13	23 40 45.20	3 24 2.7	1.6	17.6	1.26	28	15 45	2 14 17.46	11 58 30.2	2.0	21.5	1.56
14	4 9	23 41 22.88	3 19 47.2	1.6	17.6	1.25	29	15 41	2 14 14.29	11 57 59.9	2.0	21.6	1.56
15	4 6	23 42 0.97	− 3 15 29.2	1.6	17.5	1.25	30	15 37	2 14 10.34	11 57 25.8	2.0	21.7	1.56
July 16	18 25	2 5 1.36	+11 20 6.8	1.8	18.8	1.36	31	15 33	2 14 5.63	+11 56 47.7	2.0	21.7	1.57
17	18 22	2 5 28.16	11 22 16.2	1.8	18.9	1.36	Sept. 1	15 29	2 14 0.14	11 56 5.8	2.0	21.8	1.57
18	18 18	2 5 54.39	11 24 22.4	1.8	18.9	1.37	2	15 25	2 13 53.90	11 55 20.1	2.0	21.8	1.58
19	18 15	2 6 20.04	11 26 25.2	1.8	19.0	1.37	3	15 21	2 13 46.90	11 54 30.6	2.0	21.9	1.59
20	18 11	2 6 45.12	11 28 24.7	1.8	19.0	1.38	4	15 17	2 13 39.12	11 53 37.3	2.0	22.0	1.60
21	18 8	2 7 9.59	+11 30 20.6	1.8	19.1	1.38	5	15 13	2 13 30.60	+11 52 40.2	2.1	22.0	1.60
22	18 4	2 7 33.46	11 32 13.1	1.8	19.2	1.39	6	15 9	2 13 21.33	11 51 39.4	2.1	22.1	1.61
23	18 1	2 7 56.72	11 34 2.1	1.8	19.2	1.39	7	15 5	2 13 11.32	11 50 34.9	2.1	22.2	1.61
24	17 57	2 8 19.37	11 35 47.8	1.8	19.3	1.40	8	15 1	2 13 0.56	11 49 26.6	2.1	22.2	1.61
25	17 53	2 8 41.40	11 37 29.8	1.8	19.3	1.40	9	14 57	2 12 49.07	11 48 14.7	2.1	22.3	1.62
26	17 50	2 9 2.78	+11 39 8.4	1.8	19.4	1.40	10	14 53	2 12 36.84	+11 46 59.1	2.1	22.3	1.62
27	17 46	2 9 23.54	11 40 43.3	1.8	19.5	1.41	11	14 48	2 12 23.90	11 45 40.0	2.1	22.4	1.62
28	17 43	2 9 43.65	11 42 14.6	1.8	19.5	1.41	12	14 44	2 12 10.25	11 44 17.3	2.1	22.4	1.63
29	17 39	2 10 3.11	11 43 42.4	1.8	19.6	1.42	13	14 40	2 11 55.87	11 42 51.1	2.1	22.5	1.63
30	17 35	2 10 21.90	11 45 6.4	1.8	19.6	1.42	14	14 36	2 11 40.79	11 41 21.3	2.1	22.6	1.64
31	17 32	2 10 40.02	+11 46 26.9	1.8	19.7	1.43	15	14 32	2 11 25.01	+11 39 48.1	2.1	22.6	1.64
Aug. 1	17 28	2 10 57.49	11 47 43.7	1.8	19.8	1.43	16	14 28	2 11 8.55	11 38 11.4	2.1	22.7	1.64
2	17 24	2 11 14.26	11 48 57.0	1.9	19.8	1.44	17	14 23	2 10 51.40	11 36 31.4	2.1	22.7	1.65
3	17 21	2 11 30.35	11 50 6.5	1.9	19.9	1.44	18	14 19	2 10 33.58	11 34 48.1	2.1	22.8	1.65
4	17 17	2 11 45.75	11 51 12.2	1.9	20.0	1.45	19	14 15	2 10 15.09	11 33 1.4	2.1	22.8	1.65
5	17 14	2 12 0.46	+11 52 14.2	1.9	20.0	1.45	20	14 11	2 9 55.96	+11 31 11.4	2.1	22.9	1.66
6	17 10	2 12 14.48	11 53 12.6	1.9	20.1	1.46	21	14 6	2 9 36.18	11 29 18.3	2.1	22.9	1.66
7	17 6	2 12 27.80	11 54 7.2	1.9	20.2	1.46	22	14 2	2 9 15.77	11 27 22.1	2.1	23.0	1.66
8	17 2	2 12 40.42	11 54 58.1	1.9	20.2	1.46	23	13 58	2 8 54.75	11 25 22.7	2.2	23.0	1.67
9	16 59	2 12 52.32	11 55 45.2	1.9	20.3	1.47	24	13 54	2 8 33.12	11 23 20.5	2.2	23.1	1.67
10	16 55	2 13 3.50	+11 56 28.5	1.9	20.3	1.47	25	13 49	2 8 10.91	+11 21 15.4	2.2	23.1	1.67
11	16 51	2 13 13.96	11 57 8.1	1.9	20.4	1.48	26	13 45	2 7 48.12	11 19 7.4	2.2	23.2	1.68
12	16 47	2 13 23.69	11 57 43.8	1.9	20.5	1.48	27	13 41	2 7 24.77	11 16 56.6	2.2	23.2	1.68
13	16 44	2 13 32.71	11 58 15.8	1.9	20.6	1.49	28	13 36	2 7 0.87	11 14 43.1	2.2	23.2	1.68
14	16 40	2 13 40.98	11 58 44.0	1.9	20.6	1.49	29	13 32	2 6 36.46	11 12 27.2	2.2	23.3	1.68
15	16 36	2 13 48.51	+11 59 8.3	1.9	20.7	1.50	30	13 28	2 6 11.54	+11 10 8.7	2.2	23.3	1.69
16	16 32	2 13 55.30	+11 59 28.8	1.9	20.7	1.50	Oct. 1	13 23	2 5 46.13	+11 7 47.8	2.2	23.3	1.69

Stellar magnitude at opposition, in October, 1916, −2.5.

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Polar Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s
Oct. 1	13 23	2 5 46.13	+11 7 47.8	2.2	23.3	1.69
2	13 19	2 5 20.25	11 5 24.6	2.2	23.4	1.69
3	13 14	2 4 53.93	11 2 59.3	2.2	23.4	1.69
4	13 10	2 4 27.17	11 0 31.9	2.2	23.4	1.69
5	13 6	2 4 0.00	10 58 2.5	2.2	23.5	1.70
6	13 1	2 3 32.45	+10 55 31.1	2.2	23.5	1.70
7	12 57	2 3 4.52	10 52 58.0	2.2	23.5	1.70
8	12 52	2 2 36.24	10 50 23.1	2.2	23.5	1.70
9	12 48	2 2 7.63	10 47 46.7	2.2	23.6	1.70
10	12 44	2 1 38.70	10 45 8.8	2.2	23.6	1.71
11	12 39	2 1 9.50	+10 42 29.5	2.2	23.6	1.71
12	12 35	2 0 40.01	10 39 48.9	2.2	23.6	1.71
13	12 30	2 0 10.27	10 37 7.3	2.2	23.6	1.71
14	12 26	1 59 40.30	10 34 24.5	2.2	23.7	1.71
15	12 22	1 59 10.13	10 31 40.8	2.2	23.7	1.71
16	12 17	1 58 39.77	+10 28 56.2	2.2	23.7	1.71
17	12 13	1 58 9.25	10 26 11.1	2.2	23.7	1.71
18	12 8	1 57 38.59	10 23 25.4	2.2	23.7	1.71
19	12 4	1 57 7.82	10 20 39.2	2.2	23.7	1.71
20	11 59	1 56 36.94	10 17 52.6	2.2	23.7	1.71
21	11 55	1 56 6.00	+10 15 6.0	2.2	23.7	1.71
22	11 50	1 55 35.02	10 12 19.3	2.2	23.7	1.71
23	11 46	1 55 4.02	10 9 32.8	2.2	23.7	1.71
24	11 42	1 54 33.02	10 6 46.4	2.2	23.7	1.71
25	11 37	1 54 2.06	10 4 0.4	2.2	23.7	1.71
26	11 33	1 53 31.14	+10 1 15.1	2.2	23.7	1.71
27	11 28	1 53 0.31	9 58 30.2	2.2	23.7	1.71
28	11 24	1 52 29.58	9 55 46.2	2.2	23.7	1.71
29	11 19	1 51 58.99	9 53 3.1	2.2	23.7	1.71
30	11 15	1 51 28.55	9 50 21.1	2.2	23.7	1.71
31	11 10	1 50 58.28	+ 9 47 40.3	2.2	23.6	1.70
Nov. 1	11 6	1 50 28.21	9 45 0.9	2.2	23.6	1.70
2	11 2	1 49 58.38	9 42 22.8	2.2	23.6	1.70
3	10 57	1 49 28.79	9 39 46.5	2.2	23.6	1.70
4	10 53	1 48 59.46	9 37 11.8	2.2	23.6	1.70
5	10 48	1 48 30.43	+ 9 34 39.0	2.2	23.5	1.70
6	10 44	1 48 1.71	9 32 8.1	2.2	23.5	1.69
7	10 40	1 47 33.32	9 29 39.1	2.2	23.5	1.69
8	10 35	1 47 5.29	9 27 12.4	2.2	23.4	1.69
9	10 31	1 46 37.62	9 24 48.0	2.2	23.4	1.69
10	10 26	1 46 10.35	+ 9 22 25.9	2.2	23.4	1.68
11	10 22	1 45 43.48	9 20 6.5	2.2	23.3	1.68
12	10 18	1 45 17.04	9 17 49.5	2.2	23.3	1.68
13	10 13	1 44 51.05	9 15 35.3	2.2	23.3	1.68
14	10 9	1 44 25.52	9 13 23.9	2.2	23.2	1.67
15	10 5	1 44 0.46	+ 9 11 15.4	2.2	23.2	1.67
16	10 0	1 43 35.92	+ 9 9 9.9	2.2	23.1	1.67
Nov. 16	10 0	1 43 35.92	+9 9 9.9	2.2	23.1	1.67
17	9 56	1 43 11.88	9 7 7.6	2.2	23.1	1.67
18	9 52	1 42 48.39	9 5 8.6	2.2	23.1	1.66
19	9 47	1 42 25.44	9 3 12.8	2.2	23.0	1.66
20	9 43	1 42 3.06	9 1 20.4	2.1	23.0	1.65
21	9 39	1 41 41.26	+8 59 31.7	2.1	22.9	1.65
22	9 34	1 41 20.05	8 57 46.4	2.1	22.9	1.65
23	9 30	1 40 59.47	8 56 4.8	2.1	22.8	1.64
24	9 26	1 40 39.50	8 54 27.0	2.1	22.8	1.64
25	9 22	1 40 20.17	8 52 53.0	2.1	22.7	1.64
26	9 17	1 40 1.50	+8 51 23.0	2.1	22.7	1.63
27	9 13	1 39 43.51	8 49 56.9	2.1	22.6	1.63
28	9 9	1 39 26.19	8 48 35.0	2.1	22.6	1.62
29	9 5	1 39 9.56	8 47 17.1	2.1	22.5	1.62
30	9 0	1 38 53.63	8 46 3.5	2.1	22.4	1.62
Dec. 1	8 56	1 38 38.40	+8 44 54.0	2.1	22.4	1.61
2	8 52	1 38 23.89	8 43 48.8	2.1	22.3	1.61
3	8 48	1 38 10.10	8 42 47.8	2.1	22.3	1.60
4	8 44	1 37 57.05	8 41 51.3	2.1	22.2	1.60
5	8 40	1 37 44.73	8 40 59.0	2.1	22.1	1.59
6	8 36	1 37 33.14	+8 40 11.0	2.1	22.1	1.59
7	8 31	1 37 22.30	8 39 27.6	2.1	22.0	1.58
8	8 27	1 37 12.22	8 38 48.6	2.0	21.9	1.57
9	8 23	1 37 2.90	8 38 14.0	2.0	21.9	1.57
10	8 19	1 36 54.33	8 37 43.9	2.0	21.8	1.56
11	8 15	1 36 46.51	+8 37 18.3	2.0	21.8	1.56
12	8 11	1 36 39.48	8 36 57.3	2.0	21.7	1.55
13	8 7	1 36 33.20	8 36 40.6	2.0	21.6	1.55
14	8 3	1 36 27.71	8 36 28.6	2.0	21.6	1.54
15	7 59	1 36 23.00	8 36 21.3	2.0	21.5	1.54
16	7 55	1 36 19.06	+8 36 18.4	2.0	21.4	1.54
17	7 51	1 36 15.90	8 36 20.1	2.0	21.4	1.53
18	7 47	1 36 13.51	8 36 26.4	2.0	21.3	1.53
19	7 43	1 36 11.91	8 36 37.3	2.0	21.2	1.52
20	7 39	1 36 11.10	8 36 52.7	2.0	21.2	1.52
21	7 35	1 36 11.07	+8 37 12.7	2.0	21.1	1.51
22	7 31	1 36 11.83	8 37 37.2	2.0	21.0	1.51
23	7 27	1 36 13.38	8 38 6.4	2.0	21.0	1.50
24	7 24	1 36 15.70	8 38 40.1	2.0	20.9	1.50
25	7 20	1 36 18.83	8 39 18.4	1.9	20.8	1.49
26	7 16	1 36 22.73	+8 40 1.1	1.9	20.7	1.49
27	7 12	1 36 27.41	8 40 48.5	1.9	20.7	1.48
28	7 8	1 36 32.86	8 41 40.2	1.9	20.6	1.48
29	7 4	1 36 39.10	8 42 36.4	1.9	20.5	1.47
30	7 0	1 36 46.10	8 43 37.0	1.9	20.5	1.47
31	6 57	1 36 53.88	+8 44 42.0	1.9	20.4	1.46
32	6 53	1 37 2.41	+8 45 51.2	1.9	20.3	1.46

***Stellar* magnitude at opposition, in October, 1916, —2.5.**

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Polar Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Polar Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Jan. 0	12 19	6 57 39.61	+22 17 53.6	1.1	9.6	0.76	Feb. 15	9 5	6 43 48.33	+22 40 29.7	1.1	9.3	0.74
1	12 15	6 57 18.41	22 18 29.1	1.1	9.6	0.76	16	9 1	6 43 37.23	22 40 49.7	1.1	9.3	0.74
2	12 11	6 56 57.17	22 19 4.5	1.1	9.6	0.76	17	8 56	6 43 26.54	22 41 9.2	1.1	9.3	0.73
3	12 7	6 56 35.92	22 19 39.8	1.1	9.6	0.76	18	8 52	6 43 16.28	22 41 28.2	1.1	9.3	0.73
4	12 2	6 56 14.66	22 20 15.0	1.1	9.6	0.76	19	8 48	6 43 6.45	22 41 46.7	1.1	9.3	0.73
5	11 58	6 55 53.39	+22 20 50.1	1.1	9.6	0.76	20	8 44	6 42 57.06	+22 42 4.7	1.1	9.3	0.73
6	11 54	6 55 32.15	22 21 25.2	1.1	9.6	0.76	21	8 40	6 42 48.10	22 42 22.2	1.0	9.2	0.73
7	11 50	6 55 10.94	22 21 59.9	1.1	9.6	0.76	22	8 36	6 42 39.60	22 42 39.3	1.0	9.2	0.73
8	11 45	6 54 49.77	22 22 34.6	1.1	9.6	0.76	23	8 32	6 42 31.54	22 42 55.9	1.0	9.2	0.73
9	11 41	6 54 28.66	22 23 9.1	1.1	9.6	0.76	24	8 28	6 42 23.94	22 43 12.0	1.0	9.2	0.73
10	11 37	6 54 7.60	+22 23 43.3	1.1	9.6	0.76	25	8 24	6 42 16.80	+22 43 27.6	1.0	9.2	0.73
11	11 32	6 53 46.63	22 24 17.4	1.1	9.6	0.76	26	8 20	6 42 10.11	22 43 42.7	1.0	9.2	0.73
12	11 28	6 53 25.76	22 24 51.2	1.1	9.6	0.76	27	8 16	6 42 3.89	22 43 57.4	1.0	9.1	0.72
13	11 24	6 53 5.00	22 25 24.9	1.1	9.6	0.76	28	8 12	6 41 58.13	22 44 11.6	1.0	9.1	0.72
14	11 20	6 52 44.34	22 25 58.2	1.1	9.6	0.76	29	8 8	6 41 52.84	22 44 25.3	1.0	9.1	0.72
15	11 15	6 52 23.81	+22 26 31.2	1.1	9.6	0.76	Mar. 1	8 4	6 41 48.03	+22 44 38.5	1.0	9.1	0.72
16	11 11	6 52 3.43	22 27 4.0	1.1	9.6	0.76	2	8 0	6 41 43.68	22 44 51.2	1.0	9.1	0.72
17	11 7	6 51 43.20	22 27 36.4	1.1	9.6	0.76	3	7 56	6 41 39.82	22 45 3.5	1.0	9.1	0.72
18	11 2	6 51 23.13	22 28 8.5	1.1	9.6	0.76	4	7 52	6 41 36.44	22 45 15.1	1.0	9.1	0.72
19	10 58	6 51 3.23	22 28 40.3	1.1	9.6	0.76	5	7 48	6 41 33.55	22 45 26.4	1.0	9.0	0.71
20	10 54	6 50 43.51	+22 29 11.8	1.1	9.6	0.76	6	7 44	6 41 31.13	+22 45 37.0	1.0	9.0	0.71
21	10 50	6 50 23.99	22 29 42.9	1.1	9.6	0.76	7	7 40	6 41 29.21	22 45 47.2	1.0	9.0	0.71
22	10 45	6 50 4.67	22 30 13.7	1.1	9.6	0.76	8	7 36	6 41 27.76	22 45 56.9	1.0	9.0	0.71
23	10 41	6 49 45.56	22 30 44.2	1.1	9.6	0.76	9	7 32	6 41 26.81	22 46 6.1	1.0	9.0	0.71
24	10 37	6 49 26.68	22 31 14.3	1.1	9.6	0.75	10	7 28	6 41 26.33	22 46 14.8	1.0	9.0	0.71
25	10 33	6 49 8.03	+22 31 43.9	1.1	9.6	0.75	11	7 24	6 41 26.34	+22 46 23.0	1.0	8.9	0.71
26	10 28	6 48 49.64	22 32 13.3	1.1	9.5	0.75	12	7 20	6 41 26.84	22 46 30.7	1.0	8.9	0.71
27	10 24	6 48 31.50	22 32 42.3	1.1	9.5	0.75	13	7 16	6 41 27.81	22 46 38.0	1.0	8.9	0.70
28	10 20	6 48 13.64	22 33 10.9	1.1	9.5	0.75	14	7 12	6 41 29.27	22 46 44.7	1.0	8.9	0.70
29	10 16	6 47 56.04	22 33 39.0	1.1	9.5	0.75	15	7 8	6 41 31.22	22 46 50.9	1.0	8.9	0.70
30	10 12	6 47 38.73	+22 34 6.7	1.1	9.5	0.75	16	7 5	6 41 33.64	+22 46 56.7	1.0	8.9	0.70
31	10 7	6 47 21.72	22 34 34.0	1.1	9.5	0.75	17	7 1	6 41 36.54	22 47 1.9	1.0	8.8	0.70
Feb. 1	10 3	6 47 5.02	22 35 0.9	1.1	9.5	0.75	18	6 57	6 41 39.92	22 47 6.6	1.0	8.8	0.70
2	9 59	6 46 48.63	22 35 27.4	1.1	9.5	0.75	19	6 53	6 41 43.77	22 47 10.8	1.0	8.8	0.70
3	9 55	6 46 32.57	22 35 53.4	1.1	9.5	0.75	20	6 49	6 41 48.10	22 47 14.5	1.0	8.8	0.70
4	9 50	6 46 16.86	+22 36 19.0	1.1	9.5	0.75	21	6 45	6 41 52.90	+22 47 17.7	1.0	8.8	0.69
5	9 46	6 46 1.48	22 36 44.2	1.1	9.4	0.75	22	6 41	6 41 58.19	22 47 20.4	1.0	8.8	0.69
6	9 42	6 45 46.44	22 37 8.8	1.1	9.4	0.75	23	6 38	6 42 3.93	22 47 22.6	1.0	8.8	0.69
7	9 38	6 45 31.78	22 37 33.0	1.1	9.4	0.74	24	6 34	6 42 10.15	22 47 24.3	1.0	8.7	0.69
8	9 34	6 45 17.49	22 37 56.9	1.1	9.4	0.74	25	6 30	6 42 16.83	22 47 25.5	1.0	8.7	0.69
9	9 30	6 45 3.57	+22 38 20.1	1.1	9.4	0.74	26	6 26	6 42 23.99	+22 47 26.2	1.0	8.7	0.69
10	9 26	6 44 50.04	22 38 42.9	1.1	9.4	0.74	27	6 22	6 42 31.60	22 47 26.3	1.0	8.7	0.69
11	9 21	6 44 36.89	22 39 5.2	1.1	9.4	0.74	28	6 18	6 42 39.68	22 47 26.0	1.0	8.7	0.69
12	9 17	6 44 24.15	22 39 27.0	1.1	9.4	0.74	29	6 15	6 42 48.22	22 47 25.1	1.0	8.7	0.68
13	9 13	6 44 11.79	22 39 48.4	1.1	9.4	0.74	30	6 11	6 42 57.21	22 47 23.6	1.0	8.6	0.68
14	9 9	6 43 59.86	+22 40 9.3	1.1	9.3	0.74	31	6 7	6 43 6.66	+22 47 21.6	1.0	8.6	0.68
15	*9 5*	*6 43 48.33*	+22 40 29.7	1.1	9.3	0.74	Apr. 1	6 3	6 43 16.57	+22 47 19.1	1.0	8.6	0.68

Stellar magnitude at opposition, in January, 1916, —0.2.

FOR TRANSIT AT WASHINGTON.

ate.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Polar Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Polar Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
r. 1	6 3	6 43 16.57	+22 47 19.1	1.0	8.6	0.68	Nov. 16	16 27	8 11 13.24	+20 7 14.5	1.0	9.0	0.70
2	6 0	6 43 26.92	22 47 16.0	1.0	8.6	0.68	17	16 23	8 11 10.68	20 7 29.2	1.0	9.0	0.70
3	5 56	6 43 37.72	22 47 12.5	1.0	8.6	0.68	18	16 19	8 11 7.65	20 7 45.4	1.0	9.0	0.70
4	5 52	6 43 48.96	22 47 8.4	1.0	8.6	0.68	19	16 15	8 11 4.16	20 8 3.0	1.0	9.0	0.70
5	5 48	6 44 0.66	22 47 3.7	1.0	8.6	0.68	20	16 11	8 11 0.21	20 8 22.2	1.0	9.1	0.70
6	5 45	6 44 12.78	+22 46 58.4	1.0	8.5	0.67	21	16 7	8 10 55.80	+20 8 42.7	1.0	9.1	0.71
7	5 41	6 44 25.33	22 46 52.7	1.0	8.5	0.67	22	16 3	8 10 50.93	20 9 4.7	1.0	9.1	0.71
8	5 37	6 44 38.32	22 46 46.4	1.0	8.5	0.67	23	15 59	8 10 45.59	20 9 28.2	1.0	9.1	0.71
9	5 34	6 44 51.74	22 46 39.5	1.0	8.5	0.67	24	15 55	8 10 39.80	20 9 53.0	1.0	9.1	0.71
10	5 30	6 45 5.56	22 46 32.1	1.0	8.5	0.67	25	15 51	8 10 33.57	20 10 19.2	1.0	9.1	0.71
ct. 11	18 45	8 7 40.02	+20 14 19.3	1.0	8.4	0.66	26	15 47	8 10 26.88	+20 10 46.8	1.0	9.1	0.71
12	18 41	8 7 53.63	20 13 44.1	1.0	8.4	0.66	27	15 43	8 10 19.76	20 11 15.8	1.0	9.2	0.71
13	18 37	8 8 6.83	20 13 9.9	1.0	8.5	0.66	28	15 38	8 10 12.18	20 11 46.2	1.0	9.2	0.71
14	18 34	8 8 19.61	20 12 37.1	1.0	8.5	0.66	29	15 34	8 10 4.17	20 12 18.0	1.0	9.2	0.71
15	18 30	8 8 31.99	20 12 5.5	1.0	8.5	0.66	30	15 30	8 9 55.72	20 12 51.1	1.0	9.2	0.72
16	18 26	8 8 43.94	+20 11 35.1	1.0	8.5	0.66	Dec. 1	15 26	8 9 46.84	+20 13 25.4	1.0	9.2	0.72
17	18 22	8 8 55.49	20 11 5.9	1.0	8.5	0.66	2	15 22	8 9 37.53	20 14 1.0	1.0	9.2	0.72
18	18 19	8 9 6.60	20 10 38.0	1.0	8.5	0.66	3	15 18	8 9 27.82	20 14 37.9	1.1	9.3	0.72
19	18 15	8 9 17.28	20 10 11.4	1.0	8.6	0.66	4	15 14	8 9 17.68	20 15 16.0	1.1	9.3	0.72
20	18 11	8 9 27.54	20 9 46.1	1.0	8.6	0.67	5	15 10	8 9 7.14	20 15 55.3	1.1	9.3	0.72
21	18 7	8 9 37.35	+20 9 22.1	1.0	8.6	0.67	6	15 6	8 8 56.18	+20 16 35.9	1.1	9.3	0.72
22	18 4	8 9 46.73	20 8 59.5	1.0	8.6	0.67	7	15 2	8 8 44.84	20 17 17.6	1.1	9.3	0.72
23	18 0	8 9 55.66	20 8 38.2	1.0	8.6	0.67	8	14 58	8 8 33.09	20 18 0.5	1.1	9.3	0.73
24	17 56	8 10 4.15	20 8 18.3	1.0	8.6	0.67	9	14 54	8 8 20.96	20 18 44.5	1.1	9.3	0.73
25	17 52	8 10 12.20	20 7 59.7	1.0	8.6	0.67	10	14 49	8 8 8.44	20 19 29.5	1.1	9.3	0.73
26	17 48	8 10 19.81	+20 7 42.5	1.0	8.7	0.67	11	14 45	8 7 55.55	+20 20 15.8	1.1	9.4	0.73
27	17 45	8 10 26.95	20 7 26.7	1.0	8.7	0.67	12	14 41	8 7 42.29	20 21 3.0	1.1	9.4	0.73
28	17 41	8 10 33.64	20 7 12.4	1.0	8.7	0.68	13	14 37	8 7 28.66	20 21 51.3	1.1	9.4	0.73
29	17 37	8 10 39.88	20 6 59.5	1.0	8.7	0.68	14	14 33	8 7 14.67	20 22 40.7	1.1	9.4	0.73
30	17 33	8 10 45.66	20 6 48.1	1.0	8.7	0.68	15	14 28	8 7 0.33	20 23 31.0	1.1	9.4	0.73
31	17 29	8 10 50.98	+20 6 38.0	1.0	8.7	0.68	16	14 24	8 6 45.65	+20 24 22.2	1.1	9.4	0.73
ov. 1	17 26	8 10 55.84	20 6 29.4	1.0	8.8	0.68	17	14 20	8 6 30.62	20 25 14.4	1.1	9.4	0.73
2	17 22	8 11 0.24	20 6 22.1	1.0	8.8	0.68	18	14 16	8 6 15.27	20 26 7.5	1.1	9.4	0.73
3	17 18	8 11 4.18	20 6 16.4	1.0	8.8	0.68	19	14 12	8 5 59.59	20 27 1.5	1.1	9.4	0.73
4	17 14	8 11 7.66	20 6 12.1	1.0	8.8	0.68	20	14 8	8 5 43.60	20 27 56.3	1.1	9.5	0.74
5	17 10	8 11 10.68	+20 6 9.3	1.0	8.8	0.69	21	14 3	8 5 27.30	+20 28 51.9	1.1	9.5	0.74
6	17 6	8 11 13.25	20 6 7.9	1.0	8.8	0.69	22	13 59	8 5 10.70	20 29 48.3	1.1	9.5	0.74
7	17 2	8 11 15.33	20 6 7.9	1.0	8.9	0.69	23	13 55	8 4 53.82	20 30 45.5	1.1	9.5	0.74
8	16 58	8 11 16.96	20 6 9.5	1.0	8.9	0.69	24	13 51	8 4 36.65	20 31 43.4	1.1	9.5	0.74
9	16 54	8 11 18.13	20 6 12.5	1.0	8.9	0.69	25	13 47	8 4 19.22	20 32 42.0	1.1	9.5	0.74
10	16 50	8 11 18.83	+20 6 17.0	1.0	8.9	0.69	26	13 42	8 4 1.53	+20 33 41.1	1.1	9.5	0.74
11	16 46	8 11 19.06	20 6 22.9	1.0	8.9	0.69	27	13 38	8 3 43.60	20 34 40.9	1.1	9.5	0.74
12	16 43	8 11 18.83	20 6 30.4	1.0	8.9	0.69	28	13 34	8 3 25.43	20 35 41.1	1.1	9.5	0.74
13	16 39	8 11 18.13	20 6 39.1	1.0	9.0	0.70	29	13 30	8 3 7.03	20 36 42.0	1.1	9.5	0.74
14	16 35	8 11 16.96	20 6 49.4	1.0	9.0	0.70	30	13 25	8 2 48.42	20 37 43.3	1.1	9.5	0.74
15	16 31	8 11 15.33	+20 7 1.3	1.0	9.0	0.70	31	13 21	8 2 29.61	+20 38 45.0	1.1	9.5	0.74
16	16 27	8 11 13.24	+20 7 14.5	1.0	9.0	0.70	32	13 17	8 2 10.59	+20 39 47.1	1.1	9.5	0.74

Stellar magnitude at opposition, in January, 1916, −0.2.

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
June 1	16 47	21 29 16.81	−15 35 36.3	0.5	1.7	0.12	July 17	13 42	21 25 10.63	−15 56 33.8	0.5	1.8	0.12
2	16 43	21 29 15.14	15 35 46.7	0.5	1.7	0.12	18	13 38	21 25 2.24	15 57 14.6	0.5	1.8	0.12
3	16 39	21 29 13.28	15 35 58.0	0.5	1.7	0.12	19	13 34	21 24 53.76	15 57 55.7	0.5	1.8	0.12
4	16 35	21 29 11.23	15 36 10.1	0.5	1.7	0.12	20	13 30	21 24 45.18	15 58 37.2	0.5	1.8	0.12
5	16 31	21 29 9.00	15 36 23.2	0.5	1.7	0.12	21	13 26	21 24 36.52	15 59 19.0	0.5	1.8	0.12
6	16 27	21 29 6.59	−15 36 37.1	0.5	1.7	0.12	22	13 22	21 24 27.80	−16 0 1.0	0.5	1.8	0.12
7	16 23	21 29 3.98	15 36 51.9	0.5	1.7	0.12	23	13 18	21 24 19.00	16 0 43.4	0.5	1.8	0.12
8	16 19	21 29 1.19	15 37 7.4	0.5	1.7	0.12	24	13 14	21 24 10.13	16 1 25.9	0.5	1.8	0.12
9	16 15	21 28 58.23	15 37 23.8	0.5	1.7	0.12	25	13 10	21 24 1.20	16 2 8.8	0.5	1.8	0.12
10	16 11	21 28 55.09	15 37 41.1	0.5	1.7	0.12	26	13 6	21 23 52.20	16 2 51.8	0.5	1.8	0.12
11	16 7	21 28 51.78	−15 37 59.1	0.5	1.7	0.12	27	13 1	21 23 43.15	−16 3 35.1	0.5	1.8	0.12
12	16 3	21 28 48.29	15 38 18.1	0.5	1.7	0.12	28	12 57	21 23 34.05	16 4 18.5	0.5	1.8	0.12
13	15 59	21 28 44.63	15 38 37.8	0.5	1.7	0.12	29	12 53	21 23 24.89	16 5 2.1	0.5	1.8	0.12
14	15 55	21 28 40.80	15 38 58.4	0.5	1.7	0.12	30	12 49	21 23 15.68	16 5 45.9	0.5	1.8	0.12
15	15 51	21 28 36.80	15 39 19.7	0.5	1.7	0.12	31	12 45	21 23 6.44	16 6 29.7	0.5	1.8	0.12
16	15 47	21 28 32.64	−15 39 41.8	0.5	1.7	0.12	Aug. 1	12 41	21 22 57.16	−16 7 13.7	0.5	1.8	0.12
17	15 43	21 28 28.30	15 40 4.6	0.5	1.7	0.12	2	12 37	21 22 47.84	16 7 57.7	0.5	1.8	0.12
18	15 39	21 28 23.80	15 40 28.2	0.5	1.7	0.12	3	12 33	21 22 38.50	16 8 41.8	0.5	1.8	0.12
19	15 35	21 28 19.12	15 40 52.6	0.5	1.7	0.12	4	12 29	21 22 29.12	16 9 26.1	0.5	1.8	0.12
20	15 31	21 28 14.29	15 41 17.7	0.5	1.7	0.12	5	12 25	21 22 19.72	16 10 10.3	0.5	1.8	0.12
21	15 27	21 28 9.29	−15 41 43.5	0.5	1.7	0.12	6	12 21	21 22 10.30	−16 10 54.5	0.5	1.8	0.12
22	15 23	21 28 4.14	15 42 10.1	0.5	1.7	0.12	7	12 16	21 22 0.87	16 11 38.8	0.5	1.8	0.12
23	15 19	21 27 58.84	15 42 37.4	0.5	1.7	0.12	8	12 12	21 21 51.43	16 12 22.9	0.5	1.8	0.12
24	15 15	21 27 53.38	15 43 5.5	0.5	1.7	0.12	9	12 8	21 21 41.98	16 13 7.0	0.5	1.8	0.12
25	15 11	21 27 47.76	15 43 34.2	0.5	1.7	0.12	10	12 4	21 21 32.53	16 13 51.1	0.5	1.8	0.12
26	15 7	21 27 42.00	−15 44 3.6	0.5	1.7	0.12	11	12 0	21 21 23.07	−16 14 35.2	0.5	1.8	0.12
27	15 3	21 27 36.09	15 44 33.7	0.5	1.7	0.12	12	11 56	21 21 13.62	16 15 19.1	0.5	1.8	0.12
28	14 59	21 27 30.01	15 45 4.4	0.5	1.7	0.12	13	11 52	21 21 4.18	16 16 3.0	0.5	1.8	0.12
29	14 55	21 27 23.82	15 45 35.8	0.5	1.7	0.12	14	11 48	21 20 54.75	16 16 46.6	0.5	1.8	0.12
30	14 51	21 27 17.47	15 46 7.8	0.5	1.8	0.12	15	11 44	21 20 45.34	16 17 30.2	0.5	1.8	0.12
July 1	14 47	21 27 10.98	−15 46 40.3	0.5	1.8	0.12	16	11 40	21 20 35.94	−16 18 13.7	0.5	1.8	0.12
2	14 43	21 27 4.35	15 47 13.5	0.5	1.8	0.12	17	11 36	21 20 26.57	16 18 56.9	0.5	1.8	0.12
3	14 39	21 26 57.59	15 47 47.4	0.5	1.8	0.12	18	11 32	21 20 17.22	16 19 39.9	0.5	1.8	0.12
4	14 35	21 26 50.71	15 48 21.8	0.5	1.8	0.12	19	11 27	21 20 7.90	16 20 22.8	0.5	1.8	0.12
5	14 31	21 26 43.69	15 48 56.7	0.5	1.8	0.12	20	11 23	21 19 58.62	16 21 5.4	0.5	1.8	0.12
6	14 27	21 26 36.55	−15 49 32.2	0.5	1.8	0.12	21	11 19	21 19 49.36	−16 21 47.8	0.5	1.8	0.12
7	14 23	21 26 29.30	15 50 8.2	0.5	1.8	0.12	22	11 15	21 19 40.15	16 22 29.9	0.5	1.8	0.12
8	14 19	21 26 21.91	15 50 44.8	0.5	1.8	0.12	23	11 11	21 19 30.99	16 23 11.6	0.5	1.8	0.12
9	14 15	21 26 14.41	15 51 21.8	0.5	1.8	0.12	24	11 7	21 19 21.88	16 23 53.1	0.5	1.8	0.12
10	14 11	21 26 6.80	15 51 59.3	0.5	1.8	0.12	25	11 3	21 19 12.83	16 24 34.4	0.5	1.8	0.12
11	14 7	21 25 59.08	−15 52 37.3	0.5	1.8	0.12	26	10 59	21 19 3.82	−16 25 15.2	0.5	1.8	0.12
12	14 3	21 25 51.26	15 53 15.7	0.5	1.8	0.12	27	10 55	21 18 54.88	16 25 55.8	0.5	1.8	0.12
13	13 58	21 25 43.32	15 53 54.5	0.5	1.8	0.12	28	10 51	21 18 46.00	16 26 36.0	0.5	1.8	0.12
14	13 54	21 25 35.30	15 54 33.7	0.5	1.8	0.12	29	10 46	21 18 37.19	16 27 15.8	0.5	1.8	0.12
15	13 50	21 25 27.17	15 55 13.3	0.5	1.8	0.12	30	10 42	21 18 28.46	16 27 55.2	0.5	1.8	0.12
16	13 46	21 25 18.95	−15 55 53.4	0.5	1.8	0.12	31	10 38	21 18 19.79	−16 28 34.1	0.5	1.8	0.12
17	*13 42*	*21 25 10.63*	−15 56 33.8	0.5	1.8	0.12	Sept. 1	10 34	21 18 11.22	−16 29 12.6	0.5	1.8	0.12

Stellar magnitude at opposition, in August, 1916, 6.0.

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Sept. 1	10 34	21 18 11.22	−16 29 12.6	0.5	1.8	0.12	Oct. 17	7 29	21 13 56.93	−16 47 17.4	0.5	1.7	0.12
2	10 30	21 18 2.73	16 29 50.7	0.5	1.8	0.12	18	7 25	21 13 55.37	16 47 22.4	0.5	1.7	0.12
3	10 26	21 17 54.33	16 30 28.3	0.5	1.8	0.12	19	7 21	21 13 54.02	16 47 26.4	0.4	1.7	0.12
4	10 22	21 17 46.02	16 31 5.5	0.5	1.8	0.12	20	7 17	21 13 52.85	16 47 29.7	0.4	1.7	0.12
5	10 18	21 17 37.80	16 31 42.1	0.5	1.8	0.12	21	7 14	21 13 51.88	16 47 32.0	0.4	1.7	0.12
6	10 14	21 17 29.68	−16 32 18.2	0.5	1.8	0.12	22	7 10	21 13 51.11	−16 47 33.4	0.4	1.7	0.12
7	10 10	21 17 21.66	16 32 53.8	0.5	1.8	0.12	23	7 6	21 13 50.55	16 47 33.9	0.4	1.7	0.12
8	10 6	21 17 13.76	16 33 28.8	0.5	1.8	0.12	24	7 2	21 13 50.18	16 47 33.5	0.4	1.7	0.12
9	10 2	21 17 5.95	16 34 3.2	0.5	1.8	0.12	25	6 58	21 13 50.02	16 47 32.3	0.4	1.7	0.12
10	9 58	21 16 58.25	16 34 37.2	0.5	1.8	0.12	26	6 54	21 13 50.06	16 47 30.1	0.4	1.7	0.12
11	9 54	21 16 50.67	−16 35 10.6	0.5	1.8	0.12	27	6 50	21 13 50.30	−16 47 27.0	0.4	1.7	0.12
12	9 50	21 16 43.20	16 35 43.5	0.5	1.8	0.12	28	6 46	21 13 50.74	16 47 22.8	0.4	1.7	0.12
13	9 46	21 16 35.85	16 36 15.7	0.5	1.8	0.12	29	6 42	21 13 51.39	16 47 17.8	0.4	1.7	0.12
14	9 42	21 16 28.63	16 36 47.3	0.5	1.8	0.12	30	6 38	21 13 52.24	16 47 12.0	0.4	1.7	0.12
15	9 37	21 16 21.53	16 37 18.3	0.5	1.8	0.12	31	6 34	21 13 53.29	16 47 5.2	0.4	1.7	0.12
16	9 33	21 16 14.57	−16 37 48.6	0.5	1.8	0.12	Nov. 1	6 30	21 13 54.56	−16 46 57.5	0.4	1.7	0.12
17	9 29	21 16 7.74	16 38 18.3	0.5	1.8	0.12	2	6 26	21 13 56.02	16 46 48.8	0.4	1.7	0.12
18	9 25	21 16 1.04	16 38 47.4	0.5	1.8	0.12	3	6 22	21 13 57.68	16 46 39.3	0.4	1.7	0.12
19	9 21	21 15 54.47	16 39 15.7	0.5	1.8	0.12	4	6 19	21 13 59.56	16 46 28.8	0.4	1.7	0.12
20	9 17	21 15 48.05	16 39 43.4	0.5	1.8	0.12	5	6 15	21 14 1.63	16 46 17.4	0.4	1.7	0.12
21	9 13	21 15 41.77	−16 40 10.3	0.5	1.8	0.12	6	6 11	21 14 3.90	−16 46 5.2	0.4	1.7	0.12
22	9 9	21 15 35.64	16 40 36.6	0.5	1.8	0.12	7	6 7	21 14 6.38	16 45 52.0	0.4	1.7	0.12
23	9 5	21 15 29.66	16 41 2.2	0.5	1.8	0.12	8	6 3	21 14 9.05	16 45 37.9	0.4	1.7	0.12
24	9 1	21 15 23.83	16 41 27.1	0.5	1.8	0.12	9	5 59	21 14 11.93	16 45 22.9	0.4	1.7	0.12
25	8 57	21 15 18.16	16 41 51.2	0.5	1.7	0.12	10	5 55	21 14 15.00	16 45 7.1	0.4	1.7	0.12
26	8 53	21 15 12.64	−16 42 14.5	0.5	1.7	0.12	11	5 51	21 14 18.28	−16 44 50.3	0.4	1.7	0.12
27	8 49	21 15 7.28	16 42 37.1	0.5	1.7	0.12	12	5 48	21 14 21.75	16 44 32.7	0.4	1.7	0.12
28	8 45	21 15 2.08	16 42 58.9	0.5	1.7	0.12	13	5 44	21 14 25.42	16 44 14.2	0.4	1.7	0.12
29	8 41	21 14 57.06	16 43 20.0	0.5	1.7	0.12	14	5 40	21 14 29.29	16 43 54.8	0.4	1.7	0.12
30	8 37	21 14 52.19	16 43 40.3	0.5	1.7	0.12	15	5 36	21 14 33.36	16 43 34.4	0.4	1.7	0.12
Oct. 1	8 33	21 14 47.51	−16 43 59.7	0.5	1.7	0.12	16	5 32	21 14 37.63	−16 43 13.2	0.4	1.7	0.12
2	8 29	21 14 42.99	16 44 18.3	0.5	1.7	0.12	17	5 28	21 14 42.09	16 42 51.2	0.4	1.7	0.12
3	8 25	21 14 38.64	16 44 36.1	0.5	1.7	0.12	18	5 24	21 14 46.74	16 42 28.2	0.4	1.7	0.12
4	8 21	21 14 34.47	16 44 53.1	0.5	1.7	0.12	19	5 20	21 14 51.59	16 42 4.4	0.4	1.7	0.12
5	8 17	21 14 30.48	16 45 9.2	0.5	1.7	0.12	20	5 17	21 14 56.64	16 41 39.7	0.4	1.7	0.12
6	8 13	21 14 26.67	−16 45 24.5	0.5	1.7	0.12	21	5 13	21 15 1.88	−16 41 14.2	0.4	1.7	0.12
7	8 9	21 14 23.04	16 45 39.0	0.5	1.7	0.12	22	5 9	21 15 7.31	16 40 47.8	0.4	1.7	0.12
8	8 5	21 14 19.58	16 45 52.7	0.5	1.7	0.12	23	5 5	21 15 12.92	16 40 20.5	0.4	1.7	0.12
9	8 1	21 14 16.32	16 46 5.6	0.5	1.7	0.12	24	5 1	21 15 18.73	16 39 52.4	0.4	1.7	0.12
10	7 57	21 14 13.24	16 46 17.6	0.5	1.7	0.12	25	4 57	21 15 24.72	16 39 23.3	0.4	1.7	0.12
11	7 53	21 14 10.34	−16 46 28.8	0.5	1.7	0.12	26	4 54	21 15 30.91	−16 38 53.5	0.4	1.7	0.12
12	7 49	21 14 7.63	16 46 39.0	0.5	1.7	0.12	27	4 50	21 15 37.27	16 38 22.9	0.4	1.7	0.12
13	7 45	21 14 5.11	16 46 48.4	0.5	1.7	0.12	28	4 46	21 15 43.82	16 37 51.4	0.4	1.7	0.11
14	7 41	21 14 2.78	16 46 57.0	0.5	1.7	0.12	29	4 42	21 15 50.56	16 37 19.1	0.4	1.7	0.11
15	7 37	21 14 0.64	16 47 4.7	0.5	1.7	0.12	30	4 38	21 15 57.46	16 36 46.0	0.4	1.7	0.11
16	7 33	21 13 58.69	−16 47 11.5	0.5	1.7	0.12	Dec. 1	4 34	21 16 4.55	−16 36 12.1	0.4	1.7	0.11
17	7 29	21 13 56.93	−16 47 17.4	0.5	1.7	0.12	2	4 31	21 16 11.82	−16 35 37.4	0.4	1.6	0.11

Stellar magnitude at opposition, in August, 1916, 6.0.

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Jan. 0	13 38	8 16 12.01	+19 27 10.4	0.3	1.3	0.09	Feb. 15	10 32	8 11 2.01	+19 44 7.2	0.3	1.3	0.09
1	13 34	8 16 5.64	19 27 31.4	0.3	1.3	0.09	16	10 28	8 10 55.87	19 44 27.3	0.3	1.3	0.09
2	13 30	8 15 59.22	19 27 52.5	0.3	1.3	0.09	17	10 24	8 10 49.81	19 44 47.1	0.3	1.3	0.09
3	13 26	8 15 52.75	19 28 13.9	0.3	1.3	0.09	18	10 20	8 10 43.81	19 45 6.8	0.3	1.3	0.09
4	13 22	8 15 46.24	19 28 35.4	0.3	1.3	0.09	19	10 16	8 10 37.89	19 45 26.2	0.3	1.3	0.09
5	13 18	8 15 39.67	+19 28 57.2	0.3	1.3	0.09	20	10 12	8 10 32.04	+19 45 45.4	0.3	1.3	0.09
6	13 14	8 15 33.05	19 29 19.0	0.3	1.3	0.09	21	10 8	8 10 26.27	19 46 4.2	0.3	1.3	0.09
7	13 10	8 15 26.39	19 29 40.9	0.3	1.3	0.09	22	10 4	8 10 20.59	19 46 22.9	0.3	1.3	0.09
8	13 6	8 15 19.68	19 30 3.0	0.3	1.3	0.09	23	10 0	8 10 14.98	19 46 41.3	0.3	1.3	0.09
9	13 1	8 15 12.93	19 30 25.2	0.3	1.3	0.09	24	9 56	8 10 9.46	19 46 59.5	0.3	1.3	0.09
10	12 57	8 15 6.15	+19 30 47.5	0.3	1.3	0.09	25	9 52	8 10 4.02	+19 47 17.3	0.3	1.3	0.09
11	12 53	8 14 59.34	19 31 9.9	0.3	1.3	0.09	26	9 47	8 9 58.67	19 47 34.9	0.3	1.3	0.09
12	12 49	8 14 52.50	19 31 32.4	0.3	1.3	0.09	27	9 43	8 9 53.42	19 47 52.3	0.3	1.3	0.09
13	12 45	8 14 45.64	19 31 54.9	0.3	1.3	0.09	28	9 39	8 9 48.25	19 48 9.3	0.3	1.3	0.09
14	12 41	8 14 38.74	19 32 17.6	0.3	1.3	0.09	29	9 35	8 9 43.18	19 48 26.1	0.3	1.3	0.09
15	12 37	8 14 31.83	+19 32 40.3	0.3	1.3	0.09	Mar. 1	9 31	8 9 38.20	+19 48 42.5	0.3	1.3	0.09
16	12 33	8 14 24.90	19 33 3.1	0.3	1.3	0.09	2	9 27	8 9 33.32	19 48 58.6	0.3	1.3	0.09
17	12 29	8 14 17.95	19 33 25.9	0.3	1.3	0.09	3	9 23	8 9 28.55	19 49 14.5	0.3	1.3	0.09
18	12 25	8 14 11.00	19 33 48.7	0.3	1.3	0.09	4	9 19	8 9 23.87	19 49 30.0	0.3	1.3	0.09
19	12 21	8 14 4.02	19 34 11.6	0.3	1.3	0.09	5	9 15	8 9 19.30	19 49 45.1	0.3	1.3	0.09
20	12 17	8 13 57.05	+19 34 34.5	0.3	1.3	0.09	6	9 11	8 9 14.85	+19 49 59.9	0.3	1.3	0.09
21	12 13	8 13 50.05	19 34 57.4	0.3	1.3	0.09	7	9 7	8 9 10.50	19 50 14.5	0.3	1.3	0.09
22	12 9	8 13 43.06	19 35 20.3	0.3	1.3	0.09	8	9 3	8 9 6.25	19 50 28.7	0.3	1.3	0.09
23	12 5	8 13 36.08	19 35 43.2	0.3	1.3	0.09	9	8 59	8 9 2.13	19 50 42.5	0.3	1.3	0.09
24	12 1	8 13 29.10	19 36 6.1	0.3	1.3	0.09	10	8 55	8 8 58.11	19 50 55.9	0.3	1.3	0.09
25	11 57	8 13 22.12	+19 36 28.9	0.3	1.3	0.09	11	8 51	8 8 54.22	+19 51 9.1	0.3	1.3	0.09
26	11 53	8 13 15.15	19 36 51.8	0.3	1.3	0.09	12	8 47	8 8 50.43	19 51 21.9	0.3	1.3	0.09
27	11 49	8 13 8.19	19 37 14.6	0.3	1.3	0.09	13	8 43	8 8 46.77	19 51 34.3	0.3	1.3	0.09
28	11 45	8 13 1.24	19 37 37.3	0.3	1.3	0.09	14	8 39	8 8 43.21	19 51 46.3	0.3	1.3	0.09
29	11 40	8 12 54.33	19 37 59.9	0.3	1.3	0.09	15	8 35	8 8 39.78	19 51 58.0	0.3	1.3	0.09
30	11 36	8 12 47.42	+19 38 22.5	0.3	1.3	0.09	16	8 31	8 8 36.48	+19 52 9.3	0.3	1.3	0.09
31	11 32	8 12 40.54	19 38 45.0	0.3	1.3	0.09	17	8 27	8 8 33.30	19 52 20.2	0.3	1.3	0.09
Feb. 1	11 28	8 12 33.68	19 39 7.4	0.3	1.3	0.09	18	8 23	8 8 30.23	19 52 30.7	0.3	1.3	0.09
2	11 24	8 12 26.85	19 39 29.8	0.3	1.3	0.09	19	8 19	8 8 27.29	19 52 41.0	0.3	1.3	0.09
3	11 20	8 12 20.06	19 39 52.0	0.3	1.3	0.09	20	8 15	8 8 24.49	19 52 50.8	0.3	1.3	0.09
4	11 16	8 12 13.30	+19 40 14.1	0.3	1.3	0.09	21	8 11	8 8 21.79	+19 53 0.2	0.3	1.3	0.09
5	11 12	8 12 6.57	19 40 36.1	0.3	1.3	0.09	22	8 8	8 8 19.23	19 53 9.2	0.3	1.3	0.09
6	11 8	8 11 59.89	19 40 58.0	0.3	1.3	0.09	23	8 4	8 8 16.80	19 53 17.8	0.3	1.3	0.09
7	11 4	8 11 53.25	19 41 19.6	0.3	1.3	0.09	24	8 0	8 8 14.50	19 53 26.0	0.3	1.3	0.09
8	11 0	8 11 46.65	19 41 41.2	0.3	1.3	0.09	25	7 56	8 8 12.32	19 53 33.9	0.3	1.3	0.09
9	10 56	8 11 40.10	+19 42 2.6	0.3	1.3	0.09	26	7 52	8 8 10.29	+19 53 41.4	0.3	1.3	0.09
10	10 52	8 11 33.62	19 42 23.8	0.3	1.3	0.09	27	7 48	8 8 8.38	19 53 48.4	0.3	1.3	0.09
11	10 48	8 11 27.18	19 42 44.9	0.3	1.3	0.09	28	7 44	8 8 6.61	19 53 55.1	0.3	1.3	0.09
12	10 44	8 11 20.79	19 43 5.8	0.3	1.3	0.09	29	7 40	8 8 4.97	19 54 1.3	0.3	1.3	0.09
13	10 40	8 11 14.46	19 43 26.4	0.3	1.3	0.09	30	7 36	8 8 3.47	19 54 7.1	0.3	1.3	0.09
14	10 36	8 11 8.21	+19 43 46.9	0.3	1.3	0.09	31	7 32	8 8 2.09	+19 54 12.5	0.3	1.3	0.09
15	*10 32*	*8 11 2.01*	+19 44 7.2	0.3	1.3	0.09	Apr. 1	7 28	8 8 0.86	+19 54 17.5	0.3	1.3	0.09

Stellar magnitude at opposition, in January, 1916,7.7.

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s
Apr. 1	7 28	8 8 0.86	+19 54 17.5	0.3	1.3	0.09
2	7 24	8 7 59.76	19 54 22.0	0.3	1.3	0.09
3	7 20	8 7 58.81	19 54 26.2	0.3	1.3	0.09
4	7 16	8 7 57.99	19 54 30.0	0.3	1.3	0.09
5	7 12	8 7 57.30	19 54 33.4	0.3	1.3	0.09
6	7 8	8 7 56.76	+19 54 36.3	0.3	1.3	0.09
7	7 4	8 7 56.34	19 54 38.8	0.3	1.3	0.09
8	7 0	8 7 56.07	19 54 40.8	0.3	1.3	0.09
9	6 56	8 7 55.94	19 54 42.5	0.3	1.3	0.09
10	6 52	8 7 55.95	19 54 43.7	0.3	1.3	0.09
11	6 48	8 7 56.09	+19 54 44.5	0.3	1.3	0.09
12	6 45	8 7 56.38	19 54 44.8	0.3	1.3	0.09
13	6 41	8 7 56.80	19 54 44.9	0.3	1.3	0.09
14	6 37	8 7 57.36	19 54 44.4	0.3	1.3	0.09
15	6 33	8 7 58.05	19 54 43.5	0.3	1.3	0.09
16	6 29	8 7 58.90	+19 54 42.2	0.3	1.3	0.09
17	6 25	8 7 59.88	19 54 40.4	0.3	1.3	0.09
18	6 21	8 8 0.98	19 54 38.3	0.3	1.3	0.09
19	6 17	8 8 2.23	19 54 35.7	0.3	1.3	0.09
20	6 13	8 8 3.62	19 54 32.7	0.3	1.3	0.09
Oct. 21	18 26	8 28 25.29	+18 49 55.1	0.3	1.3	0.09
22	18 22	8 28 27.46	18 49 47.6	0.3	1.3	0.09
23	18 18	8 28 29.49	18 49 40.7	0.3	1.3	0.09
24	18 14	8 28 31.37	18 49 34.2	0.3	1.3	0.09
25	18 11	8 28 33.12	18 49 28.2	0.3	1.3	0.09
26	18 7	8 28 34.73	+18 49 22.7	0.3	1.3	0.09
27	18 3	8 28 36.20	18 49 17.7	0.3	1.3	0.09
28	17 59	8 28 37.53	18 49 13.2	0.3	1.3	0.09
29	17 55	8 28 38.72	18 49 9.2	0.3	1.3	0.09
30	17 51	8 28 39.79	18 49 5.5	0.3	1.3	0.09
31	17 47	8 28 40.70	+18 49 2.3	0.3	1.3	0.09
Nov. 1	17 43	8 28 41.47	18 48 59.7	0.3	1.3	0.09
2	17 39	8 28 42.11	18 48 57.6	0.3	1.3	0.09
3	17 35	8 28 42.61	18 48 56.1	0.3	1.3	0.09
4	17 31	8 28 42.97	18 48 55.0	0.3	1.3	0.09
5	17 27	8 28 43.19	+18 48 54.4	0.3	1.3	0.09
6	17 24	8 28 43.27	18 48 54.3	0.3	1.3	0.09
7	17 20	8 28 43.20	18 48 54.7	0.3	1.3	0.09
8	17 16	8 28 43.00	18 48 55.4	0.3	1.3	0.09
9	17 12	8 28 42.66	18 48 56.8	0.3	1.3	0.09
10	17 8	8 28 42.19	+18 48 58.6	0.3	1.3	0.09
11	17 4	8 28 41.58	18 49 0.9	0.3	1.3	0.09
12	17 0	8 28 40.83	18 49 3.8	0.3	1.3	0.09
13	16 56	8 28 39.94	18 49 7.1	0.3	1.3	0.09
14	16 52	8 28 38.91	18 49 10.9	0.3	1.3	0.09
15	16 48	8 28 37.74	+18 49 15.1	0.3	1.3	0.09
16	16 44	8 28 36.44	+18 49 19.9	0.3	1.3	0.09
Nov. 16	16 44	8 28 36.44	+18 49 19.9	0.3	1.3	0.09
17	16 40	8 28 35.00	18 49 25.1	0.3	1.3	0.09
18	16 36	8 28 33.43	18 49 30.9	0.3	1.3	0.09
19	16 32	8 28 31.73	18 49 37.0	0.3	1.3	0.09
20	16 28	8 28 29.89	18 49 43.6	0.3	1.3	0.09
21	16 24	8 28 27.91	+18 49 50.8	0.3	1.3	0.09
22	16 20	8 28 25.80	18 49 58.4	0.3	1.3	0.09
23	16 16	8 28 23.55	18 50 6.4	0.3	1.3	0.09
24	16 12	8 28 21.18	18 50 14.9	0.3	1.3	0.09
25	16 8	8 28 18.67	18 50 24.0	0.3	1.3	0.09
26	16 4	8 28 16.03	+18 50 33.5	0.3	1.3	0.09
27	16 0	8 28 13.27	18 50 43.4	0.3	1.3	0.09
28	15 56	8 28 10.39	18 50 53.7	0.3	1.3	0.09
29	15 52	8 28 7.37	18 51 4.5	0.3	1.3	0.09
30	15 48	8 28 4.23	18 51 15.9	0.3	1.3	0.09
Dec. 1	15 44	8 28 0.96	+18 51 27.6	0.3	1.3	0.09
2	15 40	8 27 57.57	18 51 39.7	0.3	1.3	0.09
3	15 36	8 27 54.07	18 51 52.2	0.3	1.3	0.09
4	15 32	8 27 50.44	18 52 5.1	0.3	1.3	0.09
5	15 28	8 27 46.70	18 52 18.5	0.3	1.3	0.09
6	15 24	8 27 42.85	+18 52 32.3	0.3	1.3	0.09
7	15 20	8 27 38.87	18 52 46.5	0.3	1.3	0.09
8	15 16	8 27 34.78	18 53 1.0	0.3	1.3	0.09
9	15 12	8 27 30.58	18 53 15.9	0.3	1.3	0.09
10	15 8	8 27 26.27	18 53 31.2	0.3	1.3	0.09
11	15 4	8 27 21.86	+18 53 46.9	0.3	1.3	0.09
12	15 0	8 27 17.34	18 54 3.0	0.3	1.3	0.09
13	14 56	8 27 12.73	18 54 19.3	0.3	1.3	0.09
14	14 52	8 27 8.01	18 54 36.1	0.3	1.3	0.09
15	14 48	8 27 3.18	18 54 53.3	0.3	1.3	0.09
16	14 44	8 26 58.26	+18 55 10.9	0.3	1.3	0.09
17	14 40	8 26 53.23	18 55 28.7	0.3	1.3	0.09
18	14 36	8 26 48.11	18 55 46.8	0.3	1.3	0.09
19	14 32	8 26 42.89	18 56 5.4	0.3	1.3	0.09
20	14 28	8 26 37.59	18 56 24.2	0.3	1.3	0.09
21	14 24	8 26 32.19	+18 56 43.2	0.3	1.3	0.09
22	14 20	8 26 26.70	18 57 2.6	0.3	1.3	0.09
23	14 16	8 26 21.13	18 57 22.3	0.3	1.3	0.09
24	14 12	8 26 15.47	18 57 42.4	0.3	1.3	0.09
25	14 8	8 26 9.75	18 58 2.7	0.3	1.3	0.09
26	14 4	8 26 3.93	+18 58 23.2	0.3	1.3	0.09
27	14 0	8 25 58.04	18 58 44.1	0.3	1.3	0.09
28	13 56	8 25 52.08	18 59 5.1	0.3	1.3	0.09
29	13 52	8 25 46.05	18 59 26.4	0.3	1.3	0.09
30	13 48	8 25 39.96	18 59 47.9	0.3	1.3	0.09
31	13 44	8 25 33.79	+19 0 9.6	0.3	1.3	0.09
32	13 40	8 25 27.56	+19 0 31.5	0.3	1.3	0.09

Stellar magnitude at opposition, in January, 1917, 7.7.

PART III.

PHENOMENA.

In the year 1916 there will be five eclipses, three of the Sun and two of the Moon.

I.—*A Partial Eclipse of the Moon,* 1916, January 19, visible at Washington; the beginning visible generally in extreme western Europe, the north Atlantic Ocean, North and South America, and the Pacific Ocean; the ending visible generally in North America, the north Atlantic Ocean, northwestern South America, northeast Asia, and the Pacific Ocean.

ELEMENTS OF THE ECLIPSE.

	d	h	m	s
Greenwich mean time of ☍ in right ascension, January	19	20	5	19.1

	h m s		s
Sun's right ascension	20 4 20.92	Hourly motion	10.62
Moon's right ascension	8 4 20.92	Hourly motion	123.78
	° ′ ″		′ ″
Sun's declination	−20 22 49.5	Hourly motion	+ 0 31.4
Moon's declination	+21 15 3.7	Hourly motion	− 8 51.5
Sun's equa. hor. parallax	8.9	Sun's true semidiameter	16 15.3
Moon's equa. hor. parallax	54 28.1	Moon's true semidiameter	14 49.8

CIRCUMSTANCES OF THE ECLIPSE.

		d	h	m	
Moon enters penumbra	Jan.	19	18	4.6	Greenwich Mean Time.
Moon enters shadow		19	19	55.0	
Middle of the eclipse		19	20	39.5	
Moon leaves shadow		19	21	24.0	
Moon leaves penumbra		19	23	14.3	

Contacts of shadow with Moon's limb.	Angles of position from the north point.	The Moon being in the zenith in longitude from Greenwich,	and in latitude.
	°	° ′	° ′
First	175 to E.	+116 7	+21 17
Last	140 to W.	+137 41	+21 3

Magnitude of the eclipse=0.137 (Moon's diameter=1.0).

II.—*A Total Eclipse of the Sun,* 1916, February 3, visible at Washington as a partial eclipse.

ELEMENTS OF THE ECLIPSE.

	d	h	m	s
Greenwich mean time of ☌ in right ascension, February	3	4	21	39.2

	h m s		s s
Sun and Moon's R. A.	21 3 58.74	Hourly motions	10.15 and 142.67
	° ′ ″		′ ″
Sun's declination	−16 46 18.2	Hourly motion	+ 0 43.6
Moon's declination	−16 13 52.3	Hourly motion	+13 45.9
Sun's equa. hor. parallax	8.9	Sun's true semidiameter	16 13.5
Moon's equa. hor. parallax	60 19.4	Moon's true semidiameter	16 25.4

CIRCUMSTANCES OF THE ECLIPSE.

		Greenwich Mean Time.	Longitude from Greenwich.	Latitude.
		d h m	° ′	° ′
Eclipse begins	Feb.	3 1 26.9	+109 15.5	− 3 17.1
Central eclipse begins		3 2 29.2	+121 35.6	+ 7 20.8
Central eclipse at local apparent noon		3 4 21.7	+ 61 56.5	+15 57.2
Central eclipse ends		3 5 31.0	+ 9 50.2	+49 23.8
Eclipse ends		3 6 33.3	+ 19 6.1	+39 16.0

III.—*A Partial Eclipse of the Moon*, 1916, July 14, visible at Washington; the beginning visible generally in Africa, southwestern Europe, the Atlantic Ocean, North America except the more western portions, South America, and the South Pacific Ocean; the ending visible generally in the Atlantic Ocean, North and South America, and the south Pacific Ocean.

ELEMENTS OF THE ECLIPSE.

Greenwich mean time of ☍ in right ascension, July 14ᵈ 16ʰ 29ᵐ 34ˢ.3

	h m s		s
Sun's right ascension	7 36 29.27	Hourly motion	10.12
Moon's right ascension	19 36 29.27	Hourly motion	159.64
	° ′ ″		′ ″
Sun's declination	+21 35 58.9	Hourly motion	−0 23.3
Moon's declination	−22 13 50.2	Hourly motion	+9 38.0
Sun's equa. hor. parallax	8.7	Sun's true semidiameter	15 44.1
Moon's equa. hor. parallax	61 23.4	Moon's true semidiameter	16 42.9

CIRCUMSTANCES OF THE ECLIPSE.

		d	h	m	
Moon enters penumbra	July	14	14	18.3	Greenwich Mean Time.
Moon enters shadow		14	15	19.3	
Middle of the eclipse		14	16	45.9	
Moon leaves shadow		14	18	12.5	
Moon leaves penumbra		14	19	13.6	

Contacts of shadow with Moon's limb.	Angles of position from the north point.	The Moon being in the zenith in longitude from Greenwich,	and in latitude.
	°	° ′	° ′
First	40 to E.	+49 8	−22 25
Last	70 to W.	+90 38	−21 57

Magnitude of the eclipse=0.800 (Moon's diameter=1.0).

IV.—*An Annular Eclipse of the Sun*, 1916, July 29, invisible at Washington.

ELEMENTS OF THE ECLIPSE.

Greenwich mean time of ☌ in right ascension, July 29ᵈ 14ʰ 39ᵐ 30ˢ.3

	h m s		s s
Sun and Moon's R. A.	8 35 53.91	Hourly motions	9.77 and 117.77
	° ′ ″		′ ″
Sun's declination	+18 38 11.8	Hourly motion	− 0 35.9
Moon's declination	+17 53 51.1	Hourly motion	−10 3.1
Sun's equa. hor. parallax	8.7	Sun's true semidiameter	15 45.3
Moon's equa. hor. parallax	54 7.0	Moon's true semidiameter	14 44.0

CIRCUMSTANCES OF THE ECLIPSE.

		Greenwich Mean Time.	Longitude from Greenwich.	Latitude.
		d h m	° ′	° ′
Eclipse begins	July	29 11 24.9	−103 23.2	− 8 55.8
Central eclipse begins		29 12 50.8	− 89 32.1	−28 44.6
Central eclipse at local apparent noon		29 14 39.5	−141 41.5	−36 53.7
Central eclipse ends		29 15 20.8	−178 36.5	−63 35.6
Eclipse ends		29 16 46.8	−179 5.1	−46 29.6

V.—*A Partial Eclipse of the Sun*, 1916, December 24, **invisible at Washingt**

ELEMENTS OF THE ECLIPSE.

Greenwich mean time of ☌ in right ascension, December 24d 8h 27m 39.5s

	h m s		s s
Sun and Moon's R. A.	18 11 56.27	**Hourly motions**	**11.11 and 164.50**
	° ′ ″		′ ″
Sun's declination	−23 25 21.1	**Hourly motion**	**+ 0 3.2**
Moon's declination	−24 58 58.2	**Hourly motion**	**+ 4 4.1**
Sun's equa. hor. parallax	8.9	**Sun's true semidiameter**	**16 15.7**
Moon's equa. hor. parallax	60 50.0	**Moon's true semidiameter**	**16 33.8**

CIRCUMSTANCES OF THE ECLIPSE.

		Greenwich Mean Time.	**Longitude from Greenwich.**	**Latitude.**
		d h m	° ′	° ′
Eclipse begins	Dec.	24 8 32.4	−47 39.9	−66 31.5
Greatest eclipse		24 8 46.2	−32 10.5	−65 43.2
Eclipse ends		24 9 0.1	−17 42.7	−64 1.7

Magnitude of greatest eclipse=0.011 (**Sun's diameter=1.0**).

The regions within which the first two eclipses of the Sun **are visible** laid down on the accompanying charts, **from which, by means of the dott** lines, the Greenwich mean times of **beginning and ending at any place m** be found with an uncertainty **which will vary from three or four minutes** a high Sun to fifteen or twenty **minutes when the Sun is near the horizon.**

BESSELIAN ELEMENTS OF THE TOTAL ECLIPSE OF THE SUN, 1916, FEBRUARY 3.

Greenwich Mean Time.	Coordinates of Center of Shadow on Fundamental Plane.		Direction of Axis of Shadow.			Radius of Penumbra and Shadow on Fundamental Plane.	
	x	y	Log sin d	Log cos d	μ	l_1	l_2
h m					° ′		
1 20	−1.60070	−0.11678	−9.46115	+9.98104	16 31.7	+0.54225	−0.00365
30	1.51258	0.08073	9.46110	9.98104	19 1.7	0.54227	0.00362
40	1.42445	0.04467	9.46105	9.98105	21 31.7	0.54230	0.00360
50	1.33633	−0.00861	9.46100	9.98105	24 1.7	0.54232	0.00358
2 0	−1.24821	+0.02746	−9.46095	+9.98106	26 31.7	+0.54234	−0.00356
10	1.16009	0.06354	9.46091	9.98106	29 1.7	0.54236	0.00353
20	1.07196	0.09962	9.46086	9.98106	31 31.7	0.54239	0.00351
30	0.98384	0.13571	9.46081	9.98107	34 1.7	0.54241	0.00349
40	0.89572	0.17180	9.46076	9.98107	36 31.7	0.54243	0.00347
50	0.80760	0.20790	9.46071	9.98108	39 1.7	0.54245	0.00345
3 0	−0.71948	+0.24400	−9.46066	+9.98108	41 31.7	+0.54246	−0.00344
10	0.63136	0.28011	9.46062	9.98109	44 1.7	0.54248	0.00342
20	0.54324	0.31622	9.46057	9.98109	46 31.7	0.54250	0.00340
30	0.45512	0.35234	9.46052	9.98110	49 1.7	0.54252	0.00338
40	0.36701	0.38846	9.46047	9.98110	51 31.7	0.54253	0.00337
50	0.27890	0.42459	9.46042	9.98110	54 1.7	0.54255	0.00335
4 0	−0.19078	+0.46072	−9.46037	+9.98111	56 31.7	+0.54256	−0.00334
10	0.10268	0.49686	9.46032	9.98111	59 1.7	0.54257	0.00333
20	−0.01457	0.53300	9.46028	9.98112	61 31.7	0.54259	0.00331
30	+0.07353	0.56915	9.46023	9.98112	64 1.7	0.54260	0.00330
40	0.16163	0.60530	9.46018	9.98113	66 31.7	0.54261	0.00329
50	0.24973	0.64145	9.46013	9.98113	69 1.7	0.54262	0.00328
5 0	+0.33782	+0.67761	−9.46008	+9.98114	71 31.7	+0.54263	-0.00327
10	0.42591	0.71377	9.46003	9.98114	74 1.7	0.54264	0.00326
20	0 51399	0.74994	9.45999	9.98114	76 31.7	0.54265	0.00325
30	0.60207	0.78611	9.45994	9.98115	79 1.7	0.54266	0.00324
40	0.69015	0.82228	9.45989	9.98115	81 31.7	0.54266	0.00324
50	0.77822	0.85846	9.45984	9.98116	84 1.7	0.54267	0.00323
6 0	+0.86628	+0.89464	−9.45979	+9.98116	86 31.7	+0.54268	−0.00322
10	0.95434	0.93082	9.45974	9.98117	89 1.7	0.54268	0.00322
20	1.04239	0.96701	9.45969	9.98117	91 31.7	0.54269	0.00322
30	1.13044	1.00320	9.45965	9.98118	94 1.7	0.54269	0.00321
40	+1.21848	+1.03939	−9.45960	+9.98118	96 31.7	+0.54269	−0.00321

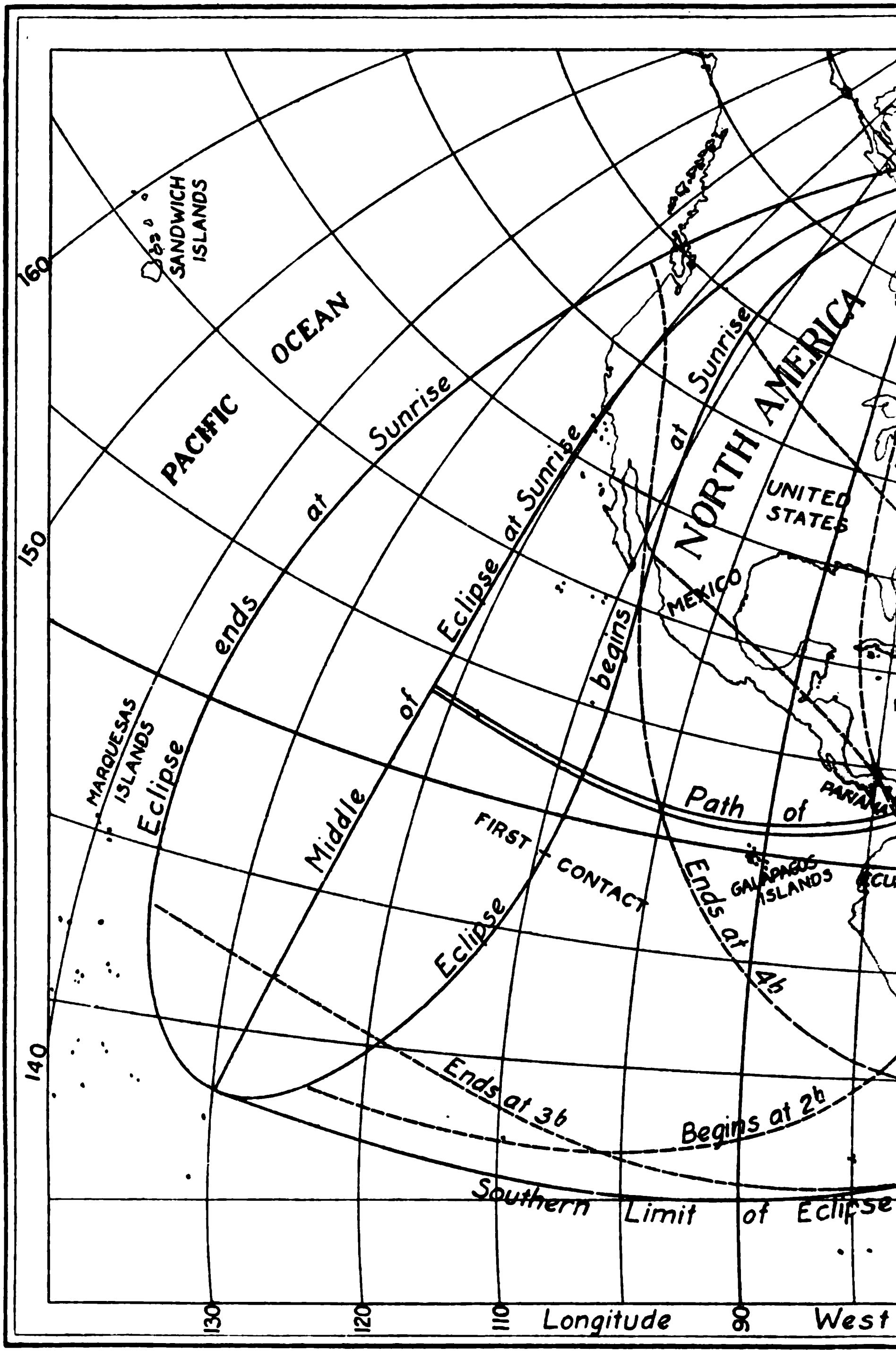
Greenwich Mean Time.	Log x' for 1 Minute.	Log y' for 1 Minute.	Log μ' for 1 Minute.	Log Tangents of Angles of Cones.	
				Penumbra.	Shadow.
h m					
1 0	+7.9451	+7.5568	+1.1761	+7.67608	+7.67391
2 0	7.9451	7.5572	1.1761	7.67608	7.67391
3 0	7.9451	7.5576	1.1761	7.67608	7.67391
4 0	7.9450	7.5579	1.1761	7.67608	7.67391
5 0	7.9449	7.5582	1.1761	7.67607	7.67390
6 0	7.9448	7.5585	1.1761	7.67607	7.67390
7 0	+7.9446	+7.5587	+1.1761	+7.67607	+7.67390

U of M

PATH OF THE SHADOW DURING THE TOTAL ECLIPSE OF THE SUN, 1916, FEBRUARY 3.

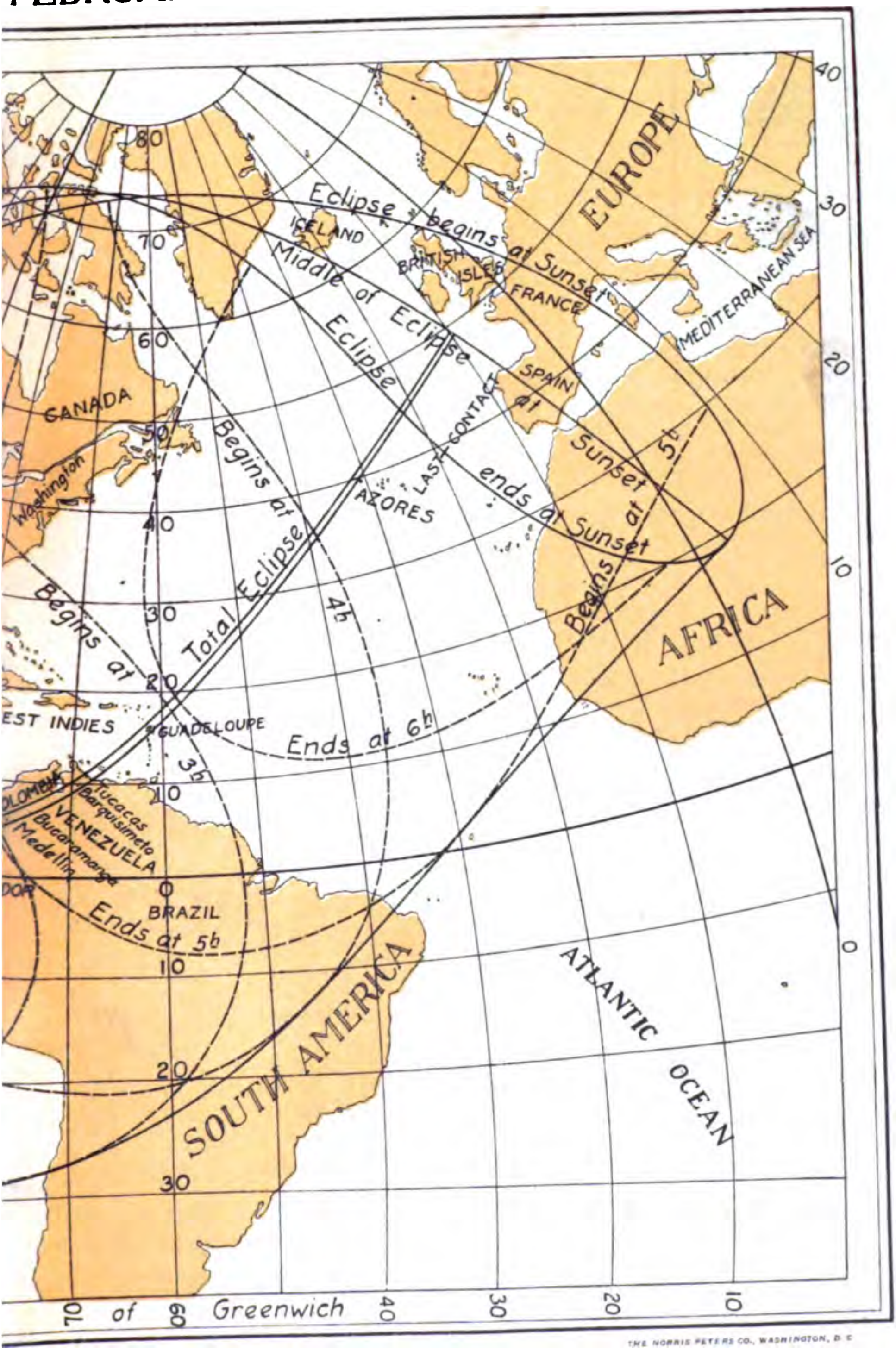
Greenwich Mean Time.	Northern Limit of Shadow Path.		Central Line.		Southern Limit of Shadow Path.		Duration of Totality on Central Line.
	Latitude.	Longitude from Greenwich.	Latitude.	Longitude from Greenwich.	Latitude.	Longitude from Greenwich.	
	° ′	° ′	° ′	° ′	° ′	° ′	m s
Limits.	+ 7 34.1	+121 34.0	+ 7 20.8	+121 35.6	+ 7 7.6	+121 37.2	. .
2^h 30^m	6 1.3	116 4.4	5 33.6	115 19.0	5 7.0	114 38.3	0 57.1
35	3 47.0	105 54.1	3 24.4	105 34.3	3 1.7	105 15.0	1 16.4
40	3 2.2	100 31.8	2 39.3	100 15.2	2 16.2	99 58.9	1 28.7
45	2 44.2	96 30.4	2 20.7	96 14.9	1 57.1	95 59.8	1 38.7
50	2 41.2	93 12.2	2 17.1	92 57.1	1 53.0	92 42.4	1 47.5
55	2 48.4	90 21.8	2 23.9	90 6.9	1 59.4	89 52.2	1 55.2
3 0	+ 3 3.3	+ 87 51.1	+ 2 38.5	+ 87 36.2	+ 2 13.7	+ 87 21.4	2 2.1
5	3 24.4	85 35.2	2 59.4	85 20.1	2 34.3	85 5.2	2 8.3
10	3 50.7	83 30.9	3 25.4	83 15.7	3 0.2	83 0.5	2 13.8
15	4 21.4	81 35.9	3 56.1	81 20.5	3 30.7	81 5.1	2 18.7
20	4 56.2	79 48.5	4 30.8	79 32.9	4 5.4	79 17.2	2 22.9
25	5 34.6	78 7.3	5 9.1	77 51.4	4 43.7	77 35.6	2 26.5
30	+ 6 16.3	+ 76 31.3	+ 5 50.9	+ 76 15.2	+ 5 25.5	+ 75 59.2	2 29.6
35	7 1.2	74 59.5	6 35.8	74 43.3	6 10.6	74 27.1	2 32.0
40	7 49.1	73 31.3	7 23.9	73 14.9	6 58.7	72 58.5	2 33.9
45	8 39.9	72 5.9	8 14.8	71 49.4	7 49.9	71 32.9	2 35.2
50	9 33.6	70 42.7	9 8.7	70 26.1	8 43.9	70 9.6	2 36.0
55	10 30.1	69 21.2	10 5.4	69 4.6	9 40.8	68 48.0	2 36.2
4 0	+11 29.4	+ 68 0.8	+11 4.9	+ 67 44.2	+10 40.5	+ 67 27.6	2 36.0
5	12 31.6	66 41.1	12 7.3	66 24.5	11 43.1	66 7.9	2 35.2
10	13 36.8	65 21.3	13 12.7	65 4.9	12 48.7	64 48.4	2 33.9
15	14 45.0	64 1.1	14 21.1	63 44.8	13 57.3	63 28.4	2 32.1
20	15 56.4	62 39.8	15 32.7	62 23.7	15 9.1	62 7.5	2 29.9
25	17 11.1	61 16.7	16 47.7	61 0.9	16 24.2	60 44.9	2 27.2
30	+18 29.5	+ 59 51.1	+18 6.2	+ 59 35.6	+17 43.0	+ 59 20.0	2 24.0
35	19 51.7	58 22.1	19 28.6	58 7.0	19 5.6	57 51.8	2 20.4
40	21 18.2	56 48.8	20 55.3	56 34.1	20 32.4	56 19.3	2 16.3
45	22 49.5	55 9.7	22 26.7	54 55.6	22 4.0	54 41.4	2 11.7
50	24 26.1	53 23.3	24 3.4	53 10.0	23 40.9	52 56.5	2 6.7
55	26 8.9	51 27.5	25 46.4	51 15.1	25 24.0	51 2.4	2 1.1
5 0	+27 59.1	+ 49 19.5	+27 36.7	+ 49 8.1	+27 14.4	+ 48 56.5	1 55.1
5	29 58.3	46 55.0	29 35.9	46 45.0	29 13.6	46 34.7	1 48.4
10	32 9.0	44 7.8	31 46.6	43 59.6	31 24.3	43 51.0	1 41.1
15	34 35.2	40 47.2	34 12.6	40 41.5	33 50.3	40 35.3	1 32.8
20	37 24.3	36 32.8	37 1.3	36 30.8	36 38.7	36 28.2	1 23.4
25	40 54.3	30 34.0	40 30.4	30 39.0	40 6.7	30 43.2	1 11.9
30	+46 34.6	+ 18 23.6	+46 1.9	+ 19 3.8	+45 30.9	+ 19 38.6	0 54.1
Limits.	+49 35.2	+ 9 56.6	+49 23.8	+ 9 50.2	+49 12.3	+ 9 43.8	. . .

TOTAL ECLIPSE OF



Note:- The hours of beginning and endir

FEBRUARY 3RD 1916



THE NORRIS PETERS CO., WASHINGTON, D. C.

g are expressed in Greenwich Mean Time.

BESSELIAN ELEMENTS OF THE ANNULAR ECLIPSE OF THE SUN, 1916, JULY 29.

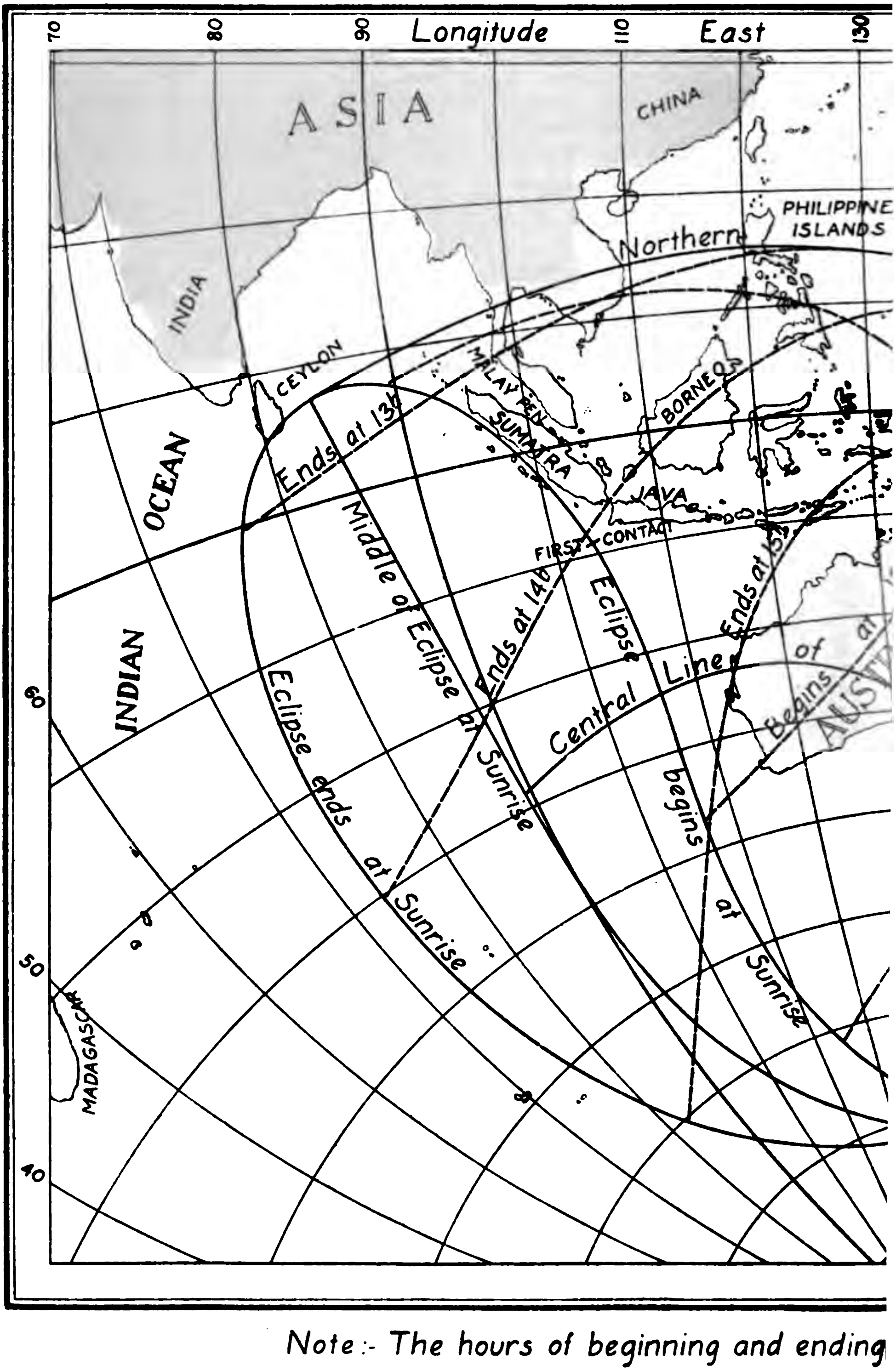
Greenwich Mean Time.	Coordinates of Center of Shadow on Fundamental Plane.		Direction of Axis of Shadow.			Radius of Penumbra and Shadow on Fundamental Plane.	
	x	y	Log sin d	Log cos d	μ	l_1	l_2
h m					° '		
11 20	−1.58299	−0.24058	+9.50532	+9.97652	168 25.6	+0.56494	+0.01893
30	1.50365	0.26966	9.50528	9.97653	170 55.6	0.56495	0.01894
40	1.42430	0.29874	9.50525	9.97653	173 25.6	0.56495	0.01894
50	1.34496	0.32783	9.50521	9.97653	175 55.6	0.56495	0.01894
12 0	−1.26561	−0.35692	+9.50517	+9.97654	178 25.6	+0.56495	+0.01894
10	1.18626	0.38602	9.50514	9.97654	180 55.7	0.56495	0.01894
20	1.10691	0.41512	9.50510	9.97655	183 25.7	0.56495	0.01894
30	1.02756	0.44423	9.50507	9.97655	185 55.7	0.56495	0.01894
40	0.94821	0.47335	9.50503	9.97655	188 25.7	0.56495	0.01894
50	0.86887	0.50246	9.50500	9.97656	190 55.7	0.56495	0.01894
13 0	−0.78952	−0.53159	+9.50496	+9.97656	193 25.7	+0.56495	+0.01894
10	0.71017	0.56072	9.50492	9.97657	195 55.7	0.56495	0.01893
20	0.63082	0.58985	9.50489	9.97657	198 25.8	0.56494	0.01893
30	0.55147	0.61899	9.50485	9.97658	200 55.8	0.56494	0.01893
40	0.47213	0.64813	9.50482	9.97658	203 25.8	0.56493	0.01892
50	0.39278	0.67728	9.50478	9.97658	205 55.8	0.56493	0.01892
14 0	−0.31344	−0.70643	+9.50474	+9.97659	208 25.8	+0.56493	+0.01891
10	0.23409	0.73559	9.50471	9.97659	210 55.8	0.56492	0.01891
20	0.15475	0.76475	9.50467	9.97660	213 25.9	0.56491	0.01890
30	−0.07541	0.79392	9.50464	9.97660	215 55.9	0.56491	0.01890
40	+0.00393	0.82309	9.50460	9.97660	218 25.9	0.56490	0.01889
50	0.08327	0.85226	9.50457	9.97661	220 55.9	0.56489	0.01888
15 0	+0.16260	−0.88144	+9.50453	+9.97661	223 25.9	+0.56488	+0.01887
10	0.24194	0.91062	9.50449	9.97662	225 55.9	0.56487	0.01886
20	0.32127	0.93981	9.50446	9.97662	228 25.9	0.56486	0.01885
30	0.40060	0.96900	9.50442	9.97662	230 56.0	0.56485	0.01884
40	0.47993	0.99820	9.50439	9.97663	233 26.0	0.56484	0.01883
50	0.55925	1.02740	9.50435	9.97663	235 56.0	0.56483	0.01882
16 0	+0.63857	−1.05660	+9.50432	+9.97664	238 26.0	+0.56482	+0.01881
10	0.71789	1.08581	9.50428	9.97664	240 56.0	0.56481	0.01880
20	0.79721	1.11502	9.50424	9.97664	243 26.0	0.56480	0.01879
30	0.87652	1.14423	9.50421	9.97665	245 56.1	0.56478	0.01877
40	0.95583	1.17345	9.50417	9.97665	248 26.1	0.56477	0.01876
50	+1.03514	−1.20267	+9.50414	+9.97666	250 56.1	+0.56475	+0.01874

Greenwich Mean Time.	Log x' for 1 Minute.	Log y' for 1 Minute.	Log μ' for 1 Minute.	Log Tangents of Angles of Cones.	
				Penumbra.	Shadow.
h m					
11 0	+7.8995	−7.4634	+1.1761	+7.66338	+7.66121
12 0	7.8995	7.4638	1.1761	7.66338	7.66121
13 0	7.8995	7.4643	1.1761	7.66338	7.66121
14 0	7.8995	7.4647	1.1761	7.66339	7.66122
15 0	7.8995	7.4651	1.1761	7.66339	7.66122
16 0	7.8994	7.4654	1.1761	7.66339	7.66122
17 0	+7.8993	−7.4658	+1.1761	+7.66339	+7.66122

PATH OF THE ANNULUS DURING THE ANNULAR ECLIPSE OF THE SUN, 1916, JULY 29.

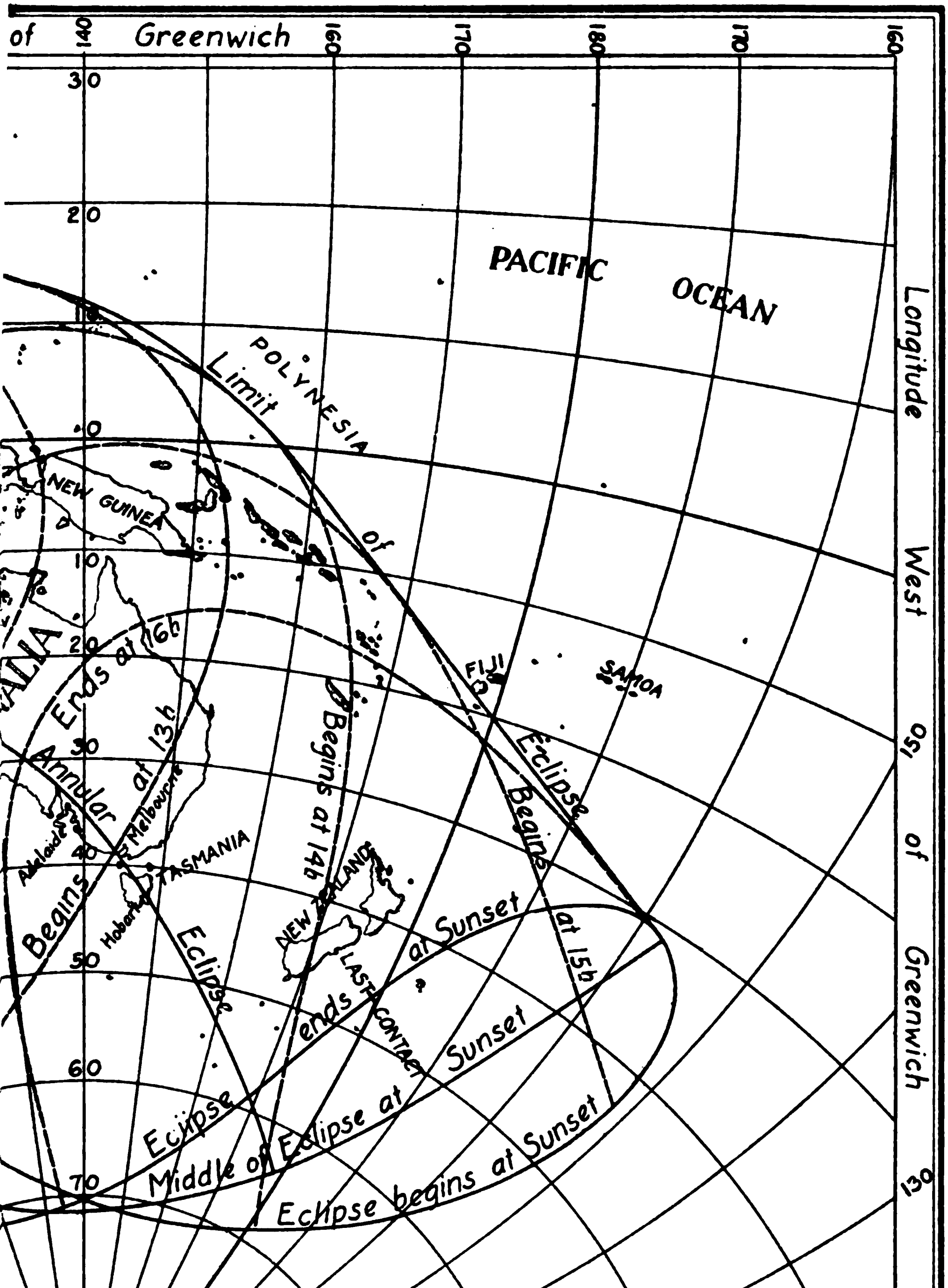
Greenwich Mean Time.	Central Line.		Duration of Annulus on Central Line.
	Latitude.	Longitude from Greenwich.	
	° ′	° ′	m s
Limits.	–28 44.6	– 89 32.1	. . .
12^{h} 55^{m}	25 10.8	101 31.1	5 27.5
13 0	–24 7.3	–106 44.3	5 39.2
5	23 38.3	110 25.7	5 48.2
10	23 27.1	113 23.1	5 55.7
15	23 27.4	115 53.5	6 2.0
20	23 36.5	118 5.6	6 7.4
25	23 52.4	120 4.3	6 12.0
30	–24 14.2	–121 52.9	6 15.9
35	24 41.2	123 33.6	6 19.0
40	25 12.8	125 8.2	6 21.4
45	25 48.7	126 37.8	6 23.2
50	26 28.7	128 3.6	6 24.3
55	27 12.7	129 26.5	6 24.9
14 0	–28 0.7	–130 47.4	6 24.9
5	28 52.6	132 6.9	6 24.3
10	29 48.6	133 25.8	6 23.2
15	30 48.7	134 44.8	6 21.7
20	31 53.2	136 4.7	6 19.7
25	33 2.3	137 26.2	6 17.2
30	–34 16.6	–138 50.3	6 14.3
35	35 36.4	140 18.2	6 11.0
40	37 2.6	141 51.1	6 7.2
45	38 36.1	143 30.9	6 3.1
50	40 18.2	145 19.7	5 58.5
55	42 11.0	147 21.2	5 53.5
15 0	–44 17.3	–149 40.6	5 47.9
5	46 42.2	152 26.4	5 41.7
10	49 35.0	155 56.1	5 34.5
15	53 18.6	160 52.3	5 25.7
20	59 51.0	171 12.8	5 11.7
Limits.	–63 35.6	–178 36.5	. . .

ANNULAR ECLIPS



Note :- The hours of beginning and ending

OF JULY 29TH 1916



THE NORRIS PETERS CO., WASHINGTON, D.C.

are expressed in Greenwich Mean Time.

BESSELIAN ELEMENTS OF THE PARTIAL ECLIPSE OF THE SUN, 1916, DECEMBER 24.

Greenwich Mean Time.	Coordinates of Center of Shadow on Fundamental Plane.		Direction of Axis of Shadow.			Radius of Penumbra on Fundamental Plane.
	x	y	Log sin d	Log cos d	μ	l
h m					° ′	
8 30	+0.02237	−1.54000	−9.59928	+9.96267	127 32.6	+0.54084
40	0.11790	1.52890	9.59928	9.96267	130 2.5	0.54083
50	0.21342	1.51779	9.59927	9.96267	132 32.5	0.54082
9 0	+0.30895	−1.50666	−9.59927	+9.96267	135 2.5	+0.54081
10	+0.40447	−1.49552	−9.59927	+9.96267	137 32.4	+0.54080

Greenwich Mean Time.	Log x' for 1 Minute.	Log y' for 1 Minute.	Log μ' for 1 Minute.	Log Tangent of Angle of Cone.
				Penumbra.
h m				
8 0	+7.9801	+7.0432	+1.1760	+7.67706
9 0	7.9801	7.0467	1.1760	7.67706
10 0	+7.9801	+7.0501	+1.1760	+7.67706

MEAN PLACES FOR 1916.0. (January 1^d.189, Greenwich.)

Name of Star.	Magnitude.	Right Ascension.	Annual Proper Motion.	Declination.	Annual Proper Motion.
		h m s	s	° ′ ″	″
36 Piscium	6.2	0 12 14.982	−0.0027	+ 7 46 26.27	−0.006
d Piscium	5.4	0 16 16.475	+0.0003	7 43 25.86	+0.016
136 B. Piscium	6.5	0 36 51.353	−0.0084	8 53 48.53	−0.082
58 Piscium	5.7	0 42 38.423	+0.0033	11 30 57.66	−0.025
75 Piscium	6.3	1 2 8.352	+0.0012	12 30 22.29	+0.042
η Piscium	3.7	1 26 59.130	+0.0015	+14 54 47.45	−0.003
101 Piscium	6.2	1 31 16.819	+0.0010	14 13 56.68	−0.001
105 Piscium	6.1	1 35 8.712	+0.0053	15 58 48.36	−0.006
3 Arietis	6.4	1 42 1.507	+0.0031	16 59 33.47	+0.015
4 Arietis	5.8	1 43 37.367	+0.0035	16 32 16.22	−0.021
ι Arietis	5.1	1 52 45.506	+0.0021	+17 24 28.35	−0.020
35 B. Arietis	6.4	1 59 5.979	−0.0008	17 51 0.17	−0.018
47 B. Arietis	6.5	2 3 8.995	−0.0037	17 37 46.99	−0.007
20 H^1. Arietis	6.4	2 4 46.053	+0.0112	16 49 51.03	−0.179
15 Arietis	5.9	2 5 58.016	+0.0059	19 6 16.06	−0.032
θ Arietis	5.6	2 13 27.003	−0.0007	+19 30 47.30	−0.003
26 Arietis	6.2	2 25 55.549	+0.0050	19 28 59.27	−0.022
ν Arietis	5.4	2 34 2.605	+0.0001	21 35 55.63	−0.021
μ Arietis	5.7	2 37 37.599	+0.0023	19 39 15.43	−0.038
47 Arietis	5.8	2 53 16.532	+0.0160	20 19 57.61	−0.021
ε Arietis (*mean*)	4.6	2 54 24.310	−0.0009	+21 0 18.17	−0.010
64 Arietis	5.8	3 19 20.631	+0.0013	24 25 38.53	−0.046
66 Arietis	6.1	3 23 31.774	+0.0006	22 30 54.87	−0.112
7 Tauri	5.9	3 29 27.958	+0.0013	24 11 0.66	−0.023
11 Tauri	6.1	3 35 45.091	+0.0014	25 3 31.47	−0.008
16 Tauri	5.4	3 39 48.399	+0.0009	+24 1 33.70	−0.049
17 Tauri	3.8	3 39 53.043	+0.0016	23 51 0.22	−0.050
18 Tauri	5.6	3 40 8.777	+0.0004	24 34 35.94	−0.038
q Tauri	4.3	3 40 12.231	+0.0010	24 12 17.04	−0.034
20 Tauri	4.1	3 40 49.510	+0.0016	24 6 22.10	−0.044
21 Tauri	5.8	3 40 53.993	+0.0012	+24 17 35.35	−0.046
22 Tauri	6.5	3 41 2.434	+0.0006	24 16 0.10	−0.039
23 Tauri	4.3	3 41 20.240	+0.0017	23 41 14.83	−0.050
η Tauri	3.0	3 42 29.281	+0.0016	23 50 46.45	−0.050
104 B. Tauri	5.5	3 43 22.235	+0.0008	23 9 50.38	−0.045
27 Tauri	3.7	3 44 9.852	+0.0013	+23 47 50.75	−0.048
28 Tauri	5.2	3 44 11.139	+0.0009	23 52 51.38	−0.046
14 H. Tauri	5.3	3 45 15.742	+0.0033	25 19 36.90	−0.103
36 Tauri	5.6	3 59 20.059	+0.0001	23 52 31.76	−0.022
p Tauri	5.6	4 5 42.728	−0.0024	26 15 45.53	−0.042
χ Tauri	5.3	4 17 28.108	+0.0028	+25 25 55.07	−0.029
62 Tauri	6.1	4 18 55.749	+0.0008	24 6 22.27	−0.019
17 B. Aurigæ	6.0	4 47 32.164	+0.0033	27 45 28.44	−0.037
315 B. Tauri	6.3	4 51 8.552	−0.0001	24 27 31.99	−0.033
k Tauri	5.6	4 53 0.862	+0.0023	24 55 17.59	−0.061
38 B. Aurigæ	6.5	4 59 22.687	−0.0001	+27 34 46.58	−0.075
47 B. Aurigæ	6.0	5 4 28.383	. . . .	27 55 32.01	. . .
354 B. Tauri	6.4	5 15 42.728	−0.0027	27 52 23.36	−0.015
118 Tauri	5.4	5 24 6.282	+0.0015	25 5 0.28	−0.038
107 B. Aurigæ	6.5	5 30 39.171	−0.0013	27 36 30.05	−0.076
112 B. Aurigæ	5.7	5 31 53.972	−0.0004	+26 52 21.75	−0.039
125 Tauri	5.1	5 34 31.834	+0.0018	25 51 3.59	−0.029
132 Tauri	5.0	5 43 51.624	0.0000	+24 32 25.41	−0.023

MEAN PLACES FOR 1916.0. (January 1^d.189, Greenwich.)

Name of Star.	Magnitude.	Right Ascension.	Annual Proper Motion.	Declination.	Annual Proper Motion.
		h m s	s	° ′ ″	″
406 B. Tauri	5.6	5 45 40.423	−0.0013	+27 56 37.81	+0.011
136 Tauri	4.6	5 48 2.882	+0.0013	27 35 36.25	−0.020
412 B. Tauri	5.8	5 51 47.480	. . . .	24 14 18.19	. . .
139 Tauri	4.7	5 52 46.919	0.0000	25 56 40.31	−0.007
415 B. Tauri	6.1	5 55 43.829	+0.0018	27 34 8.34	−0.001
5 Geminorum	5.9	6 6 23.261	+0.0011	+24 26 23.06	−0.061
8 Geminorum	6.1	6 11 11.120	−0.0009	23 59 53.02	−0.026
52 B. Geminorum	6.5	6 32 18.294	−0.0021	24 39 41.32	−0.002
ε Geminorum	3.2	6 38 45.897	−0.0001	25 12 55.35	−0.018
87 B. Geminorum	5.8	6 46 54.133	−0.0006	23 42 7.03	−0.021
37 Geminorum	5.7	6 50 8.794	−0.0028	+25 28 54.40	+0.014
39 Geminorum	6.2	6 53 36.887	−0.0117	26 11 32.63	+0.086
40 Geminorum	6.3	6 54 16.800	−0.0012	26 1 45.03	−0.015
ω Geminorum	5.2	6 57 17.777	−0.0003	24 20 10.43	0.000
44 Geminorum	5.9	7 0 15.036	0.0000	22 45 51.15	−0.019
48 Geminorum	5.8	7 7 20.252	−0.0009	+24 16 12.72	−0.041
52 Geminorum	6.1	7 9 33.823	+0.0038	25 1 55.16	−0.086
δ Geminorum	3.5	7 15 6.499	−0.0010	22 8 16.82	−0.015
A Geminorum	5.1	7 18 21.334	−0.0051	25 12 46.75	−0.014
58 Geminorum	6.0	7 18 25.352	−0.0022	23 6 28.11	−0.054
149 B. Geminorum	6.4	7 21 52.513	−0.0219	+21 42 16.19	−0.022
63 Geminorum	5.3	7 22 45.321	−0.0035	21 37 5.29	−0.110
B. D.+23° 1744	6.4	7 27 48.701	−0.0010	23 4 3.43	−0.007
187 B. Geminorum	6.3	7 35 56.944	+0.0011	23 12 50.57	+0.007
192 B. Geminorum	6.3	7 38 22.151	−0.0014	22 35 54.46	+0.025
79 Geminorum	6.3	7 40 13.546	−0.0013	+20 31 6.94	−0.012
82 Geminorum	6.3	7 43 32.390	−0.0010	23 20 59.18	−0.001
209 B. Geminorum	6.2	7 47 3.765	−0.0029	19 32 27.90	−0.030
85 Geminorum	5.2	7 50 45.888	−0.0011	20 6 23.79	−0.048
217 B. Geminorum	6.3	7 55 54.378	−0.0018	20 2 50.55	−0.007
10 H. Cancri	6.1	7 59 54.111	−0.0020	+19 4 48.67	−0.046
μ Cancri	5.5	8 2 49.419	+0.0019	21 49 34.62	−0.084
49 B. Cancri	6.0	8 15 27.206	+0.0052	21 0 48.18	−0.063
d^1 Cancri	5.9	8 18 33.377	−0.0038	18 36 9.73	−0.031
d^2 Cancri	6.2	8 21 4.740	−0.0132	17 19 26.08	−0.153
θ Cancri	5.5	8 26 48.516	−0.0039	+18 22 44.25	−0.068
102 B. Cancri	6.5	8 35 32.829	−0.0048	19 58 4.03	−0.010
ε Cancri	6.3	8 35 38.170	−0.0007	19 50 33.53	−0.027
δ Cancri	4.2	8 39 54.842	−0.0008	18 27 49.59	−0.240
139 B. Cancri	6.1	8 45 58.380	−0.0011	19 8 47.57	−0.001
54 Cancri	6.3	8 46 20.903	−0.0075	+15 39 46.70	+0.076
X Cancri (*var.*)	6.2	8 50 39.162	+0.0009	17 33 6.30	+0.013
o^1 Cancri	5.1	8 52 33.976	+0.0041	15 38 44.29	+0.022
o^2 Cancri	5.7	8 52 53.861	+0.0043	15 54 16.57	+0.023
81 Cancri	6.4	9 7 41.920	−0.0359	15 20 6.89	+0.244
π Cancri	5.6	9 10 35.780	−0.0022	+15 17 26.32	−0.008
227 B. Cancri	6.4	9 16 37.334	. . . .	15 43 42.04	. . .
ξ Leonis	5.1	9 27 25.210	−0.0063	11 40 20.74	−0.084
ο Leonis	3.8	9 36 40.165	−0.0096	10 16 30.54	−0.033
18 Leonis	5.8	9 41 51.961	−0.0006	12 11 50.80	+0.008
19 Leonis	6.4	9 42 55.034	−0.0049	+11 57 26.23	+0.008
R Leonis (*var.*)	5–10	9 43 2.528	−0.0005	11 49 8.76	−0.040
83 B. Leonis	5.9	9 51 58.834	−0.0074	+ 9 19 54.41	+0.017

MEAN PLACES FOR 1916.0. (January 1^d.189, Greenwich.)

Name of Star.	Magnitude.	Right Ascension.	Annual Proper Motion.	Declination.	Annual Proper Motion.
		h m s	s	° ′ ″	″
89 B. Leonis	6.2	9 53 40.745	+0.0010	+ 8 42 55.56	−0.029
π Leonis	4.9	9 55 46.547	−0.0020	8 26 51.90	−0.027
A Leonis	4.6	10 3 26.912	−0.0057	10 24 35.02	−0.067
43 Leonis	6.3	10 18 36.791	−0.0017	6 58 10.48	−0.101
155 B. Leonis	6.5	10 18 52.892	−0.0167	6 7 14.62	−0.071
48 Leonis	5.2	10 30 25.171	−0.0072	+ 7 23 11.29	+0.046
35 Sextantis	6.1	10 38 59.399	+0.0018	5 11 20.05	−0.019
d Leonis	5.0	10 56 13.382	+0.0004	4 4 7.38	−0.022
p^4 Leonis	5.7	11 2 37.184	−0.0253	2 24 42.76	−0.080
p^5 Leonis	5.3	11 9 27.593	−0.0029	0 23 15.75	−0.003
75 Leonis	5.4	11 12 58.050	+0.0027	+ 2 28 21.62	−0.145
76 Leonis	6.0	11 14 36.303	−0.0037	2 6 40.34	−0.053
359 B. Leonis	6.3	11 18 59.899	−0.0024	+ 0 35 35.95	−0.015
388 B. Leonis	6.3	11 23 36.188	−0.0025	− 1 14 14.64	+0.007
e Leonis	5.1	11 26 1.390	+0.0018	2 32 23.02	−0.008
υ Leonis	4.5	11 32 38.870	0.0000	− 0 21 35.47	+0.039
431 B. Leonis	6.2	11 34 6.516	−0.0028	1 58 17.15	+0.047
13 B. Virginis	5.9	11 46 44.591	+0.0008	4 51 57.75	+0.006
64 B. Virginis	6.5	12 6 8.595	−0.0004	7 18 25.28	+0.017
78 B. Virginis	6.5	12 9 57.247	−0.0051	5 15 7.71	+0.114
q Virginis	5.3	12 29 26.539	−0.0057	− 8 59 19.31	+0.004
χ Virginis	4.8	12 34 54.542	−0.0056	7 32 0.49	−0.031
370 B. Virginis	6.0	12 49 56.310	−0.0058	11 11 36.06	−0.037
69 Virginis	4.9	13 22 58.182	−0.0086	15 32 17.99	+0.013
75 Virginis	5.6	13 28 22.209	−0.0050	14 55 52.16	+0.004
83 Virginis	5.6	13 39 57.706	+0.0007	−15 45 25.25	−0.011
85 Virginis	6.1	13 41 3.544	−0.0029	15 20 45.03	−0.034
87 Virginis	5.8	13 42 50.974	+0.0025	17 26 23.19	−0.046
89 Virginis	5.1	13 45 18.232	−0.0077	17 42 58.11	−0.040
43 H. Virginis	5.5	14 10 46.165	−0.0031	17 48 33.31	−0.015
231 G. Virginis	6.4	14 12 24.947	−0.0005	−18 11 43.43	+0.106
236 G. Virginis	5.7	14 13 59.390	−0.0039	18 19 37.76	−0.001
9 G. Libræ	6.5	14 30 6.990	+0.0032	20 4 16.41	−0.004
17 G. Libræ	6.4	14 41 24.812	−0.0047	20 49 13.41	−0.121
18 G. Libræ	6.1	14 42 26.881	−0.0032	20 58 23.06	−0.014
43 B. Libræ	5.7	14 52 33.447	+0.0745	−21 2 16.10	−1.793
47 G. Libræ	6.1	15 1 36.199	+0.0065	21 42 20.28	−0.051
64 G. Libræ	5.8	15 11 30.636	−0.0028	22 5 21.06	+0.018
153 B. Libræ	6.3	15 28 10.560	−0.0006	24 12 17.52	−0.042
169 B. Libræ	6.0	15 32 51.556	−0.0017	22 51 48.79	−0.068
177 B. Libræ	6.2	15 34 24.728	−0.0016	−22 52 34.32	−0.034
42 Libræ	5.0	15 35 18.725	−0.0018	23 32 45.12	−0.027
b Scorpii	4.7	15 45 55.379	−0.0023	25 29 48.77	−0.044
A Scorpii	4.6	15 48 33.918	−0.0017	25 4 37.30	−0.023
31 B. Scorpii	5.4	15 48 52.601	−0.0022	24 17 1.47	−0.037
32 B. Scorpii	5.3	15 48 55.686	−0.0023	−23 43 42.31	−0.016
3 Scorpii	5.9	15 49 36.677	−0.0031	24 59 43.75	−0.029
4 Scorpii	5.7	15 50 25.281	−0.0038	26 1 8.79	−0.028
40 B. Scorpii	5.4	15 53 32.380	−0.0031	24 35 23.09	+0.004
π Scorpii	3.0	15 53 46.018	−0.0010	25 52 23.56	−0.048
48 B. Scorpii	4.9	15 58 15.872	−0.0048	−25 37 55.06	−0.043
50 B. Scorpii	6.4	15 58 51.924	+0.0017	−24 29 43.76	−0.032

MEAN PLACES FOR 1916.0. (January 1^d.189, Greenwich.)

Name of Star.	Magnitude.	Right Ascension.	Annual Proper Motion.	Declination.	Annual Proper Motion.
		h m s	s	° ′ ″	″
57 B. Scorpii	5.7	16 1 5.617	−0.0011	−23 22 40.33	−0.004
24 G. Scorpii	6.2	16 2 49.247	0.0000	24 14 17.28	−0.068
65 B. Scorpii	5.5	16 3 0.316	+0.0095	26 6 7.64	+0.023
27 G. Scorpii	5.8	16 3 42.678	+0.0032	23 27 42.72	−0.012
41 G. Scorpii	6.3	16 8 42.240	−0.0004	24 12 29.26	−0.034
85 B. Scorpii	6.0	16 9 47.841	−0.0005	−25 15 52.05	+0.012
19 Scorpii	4.9	16 15 34.705	−0.0012	23 58 3.51	−0.013
σ Scorpii	3.1	16 16 4.779	−0.0011	25 23 32.01	−0.030
α Scorpii	1.2	16 24 15.249	−0.0006	26 14 47.60	−0.028
22 Scorpii	4.8	16 25 6.113	−0.0004	24 55 51.78	−0.016
116 B. Scorpii	6.2	16 26 13.394	−0.0013	−26 21 20.39	−0.037
126 B. Scorpii	6.1	16 36 30.626	−0.0023	24 18 21.25	−0.004
134 B. Scorpii	6.4	16 39 4.635	+0.0012	27 17 57.66	−0.014
88 B. Ophiuchi	6.3	16 54 49.022	+0.0005	24 57 55.82	−0.015
26 Ophiuchi	5.8	16 55 0.647	+0.0036	24 51 42.30	−0.053
118 B. Ophiuchi	6.2	17 1 40.788	−0.0008	−26 24 1.63	−0.046
137 B. Ophiuchi	6.3	17 7 4.248	+0.0058	25 9 8.10	−0.045
95 G. Ophiuchi	6.1	17 7 9.446	+0.0008	27 39 32.92	−0.029
36 Ophiuchi (*First Star*)	5.4	17 10 10.761	−0.0369	26 28 50.34	−1.169
θ Ophiuchi	3.4	17 16 50.939	−0.0006	24 55 0.35	−0.036
43 Ophiuchi	5.4	17 18 4.293	−0.0002	−28 3 45.04	−0.040
136 G. Ophiuchi	6.3	17 21 43.349	−0.0010	25 52 11.77	−0.003
151 G. Ophiuchi	6.0	17 26 31.425	+0.0012	26 12 22.29	−0.026
163 G. Ophiuchi	6.3	17 38 0.350	+0.0002	27 50 40.43	−0.017
χ Sagittarii (*var.*)	4.4	17 42 16.356	+0.0002	27 47 59.34	−0.015
4 G. Sagittarii	6.2	17 43 12.613	−0.0003	−26 56 46.04	−0.030
63 Ophiuchi	6.1	17 49 43.904	−0.0001	24 52 17.05	−0.015
10 G. Sagittarii	5.7	17 51 23.602	+0.0024	28 3 8.53	+0.015
7 Sagittarii	5.5	17 57 42.208	−0.0003	24 16 57.01	−0.007
9 Sagittarii	6.0	17 58 43.358	−0.0006	24 21 48.19	−0.006
66 B. Sagittarii	4.7	18 12 47.708	0.0000	−27 4 25.46	+0.015
67 B. Sagittarii	6.4	18 13 29.657	−0.0044	25 38 14.07	−0.062
70 B. Sagittarii	6.4	18 16 21.147	+0.0013	24 57 14.38	−0.001
68 G. Sagittarii	6.2	18 22 29.563	0.0000	26 41 7.67	−0.046
λ Sagittarii	2.9	18 22 47.209	−0.0033	25 28 9.43	−0.199
69 G. Sagittarii	6.3	18 22 51.810	+0.0018	−26 48 30.14	−0.032
86 B. Sagittarii	6.5	18 23 43.012	−0.0063	26 38 10.42	−0.054
24 Sagittarii	5.7	18 28 45.614	−0.0002	24 5 45.63	−0.020
117 B. Sagittarii	5.8	18 33 24.143	−0.0015	23 34 39.05	−0.020
26 Sagittarii	6.1	18 36 44.258	+0.0021	23 54 45.29	−0.023
126 B. Sagittarii	5.7	18 39 39.759	−0.0008	−25 5 47.06	−0.041
ν^1 Sagittarii	5.0	18 49 5.945	+0.0001	22 50 57.28	−0.021
ν^2 Sagittarii	5.1	18 50 2.487	+0.0069	22 46 37.75	−0.024
σ Sagittarii	2.1	18 50 3.394	−0.0003	26 24 7.93	−0.075
154 B. Sagittarii	5.9	18 50 55.523	−0.0010	23 16 54.34	−0.021
162 B. Sagittarii	6.4	18 53 11.524	−0.0009	−24 59 23.23	−0.020
127 G. Sagittarii	6.4	18 55 15.555	+0.0023	25 3 35.36	+0.051
168 B. Sagittarii	6.3	18 56 33.980	+0.0005	22 48 52.35	+0.009
172 B. Sagittarii	5.8	18 57 19.375	+0.0002	24 57 48.63	−0.172
189 B. Sagittarii	6.1	19 3 6.704	+0.0012	24 47 21.82	+0.001
191 B. Sagittarii	6.5	19 3 40.007	−0.0011	−23 19 25.38	−0.057
199 B. Sagittarii	6.4	19 7 26.877	−0.0003	−21 47 55.53	−0.040

MEAN PLACES FOR 1916.0. (January $1^d.189$, Greenwich.)

Name of Star.	Magnitude.	Right Ascension.	Annual Proper Motion.	Declination.	Annual Proper Moti
		h m s	s	° ′ ″	″
ψ Sagittarii	4.9	19 10 23.449	+0.0025	−25 24 8.98	−0.035
208 B. Sagittarii	6.1	19 10 26.217	+0.0072	24 19 23.71	−0.078
222 B. Sagittarii	5.5	19 15 36.149	−0.0016	22 33 35.04	+0.026
χ Sagittarii	4.9	19 20 9.885	+0.0033	24 40 21.42	−0.063
49 Sagittarii	5.5	19 20 24.701	−0.0017	24 7 39.82	+0.001
50 Sagittarii	5.5	19 21 18.614	+0.0019	−21 56 37.83	+0.001
253 B. Sagittarii	6.1	19 25 55.014	+0.0026	21 29 16.07	−0.028
53 Sagittarii	6.3	19 34 46.694	−0.0004	23 37 10.84	−0.037
274 B. Sagittarii	6.1	19 35 4.274	+0.0018	23 37 20.24	−0.031
f Sagittarii	5.1	19 41 27.794	−0.0099	19 57 50.06	−0.088
329 B. Sagittarii	6.1	19 56 24.498	+0.0010	−22 58 8.39	−0.005
336 B. Sagittarii	6.5	19 58 45.782	−0.0019	22 49 54.44	+0.052
σ Capricorni	5.5	20 14 32.919	−0.0002	19 22 53.27	−0.006
π Capricorni	5.2	20 22 30.878	+0.0004	18 29 15.96	−0.002
ρ Capricorni	5.0	20 24 4.266	−0.0013	18 5 31.78	−0.020
ο Capricorni	5.6	20 25 5.089	+0.0011	−18 51 43.08	−0.081
47 B. Capricorni	6.2	20 30 47.156	+0.0055	16 48 54.69	−0.033
υ Capricorni	5.3	20 35 16.187	−0.0018	18 26 6.01	−0.007
61 B. Capricorni	5.9	20 35 49.500	−0.0032	16 25 25.19	+0.082
81 B. Capricorni	6.4	20 44 34.773	−0.0004	18 20 46.93	−0.019
19 Capricorni	5.7	20 50 3.178	−0.0041	−18 14 31.54	−0.013
94 B. Capricorni	5.7	20 52 58.641	+0.0046	16 21 18.69	+0.030
95 B. Capricorni	5.9	20 54 2.955	. . . .	14 48 29.12	. . .
21 Capricorni	6.5	20 56 8.249	−0.0025	17 51 32.41	−0.002
θ Capricorni	4.2	21 1 13.626	+0.0050	17 34 2.73	−0.066
29 Capricorni	5.5	21 11 6.005	+0.0016	−15 31 16.35	+0.004
53 B. Aquarii	6.5	21 11 23.640	+0.0004	13 33 3.66	−0.039
18 Aquarii	5.5	21 19 36.160	+0.0054	13 14 21.35	+0.007
72 B. Aquarii	6.5	21 23 40.869	−0.0045	11 55 57.62	+0.008
137 B. Capricorni	6.2	21 34 57.287	+0.0001	10 57 19.00	−0.010
c^1 Capricorni	5.3	21 40 31.615	+0.0004	− 9 28 7.09	+0.008
c^2 Capricorni	6.3	21 41 47.470	+0.0008	9 39 50.83	+0.001
λ Capricorni	5.5	21 42 0.892	+0.0015	11 45 13.82	−0.004
151 B. Capricorni	6.1	21 45 8.758	−0.0009	13 6 53.36	+0.031
96 B. Aquarii	6.5	21 49 6.632	−0.0001	10 42 27.35	+0.006
θ Aquarii	4.3	22 12 24.128	+0.0073	− 8 12 6.99	−0.019
150 B. Aquarii	6.0	22 12 26.611	−0.0034	9 27 32.34	−0.005
ρ Aquarii	5.3	22 15 46.808	+0.0008	8 14 36.57	−0.008
170 B. Aquarii	6.0	22 19 7.942	+0.0012	7 37 9.73	+0.033
51 Aquarii	5.8	22 19 44.379	+0.0011	5 15 44.82	−0.011
186 B. Aquarii	6.1	22 26 54.116	+0.0129	− 6 59 3.67	−0.129
κ Aquarii	5.2	22 33 24.424	−0.0049	4 39 41.81	−0.113
207 B. Aquarii	6.3	22 36 27.219	. . . .	3 59 28.80	. . .
252 B. Aquarii	5.8	22 50 49.528	−0.0003	5 26 7.50	+0.009
6 G. Piscium	6.2	22 53 56.037	+0.0002	2 50 43.37	−0.082
22 B. Piscium	6.4	23 19 13.388	+0.0043	− 0 10 11.38	+0.038
κ Piscium	4.9	23 22 37.584	+0.0056	+ 0 47 44.38	−0.093
9 Piscium	6.4	23 22 56.623	+0.0032	0 39 40.03	−0.029
16 Piscium	5.7	23 32 6.082	−0.0074	1 38 9.48	+0.057
λ Piscium	4.6	23 37 45.599	−0.0092	1 19 3.54	−0.154
19 Piscium	5.4	23 42 5.906	−0.0034	+ 3 1 14.72	−0.020
22 Piscium	5.8	23 47 39.791	+0.0009	+ 2 27 48.33	−0.011

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JANUARY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1916.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
47 G. Libræ	6.1	−0.04	− 2.8	−21 42.4	1 2 24.0	+ 6 2.1	−0.8010	0.5842	−0.1598	−14	−90
64 G. Libræ	5.8	0.08	2.9	22 5.4	6 17.4	+ 9 46.2	−1.0193	0.5882	0.1503	−29	−90
153 B. Libræ	6.3	0.16	2.7	24 12.3	12 43.2	− 8 3.6	+0.1756	0.5946	0.1336	+35	−33
42 Libræ	5.0	0.17	3.0	23 32.8	15 26.0	− 5 27.5	−0.8314	0.5972	0.1262	−19	−90
b Scorpii	4.7	0.22	2.8	25 29.9	19 25.6	− 1 37.8	+0.6226	0.6007	0.1149	+60	− 8
A Scorpii	4.6	−0.22	− 3.0	−25 4.7	20 24.9	− 0 41.0	+0.0943	0.6016	−0.1121	+29	−38
31 B. Scorpii	5.4	0.22	3.1	24 17.1	20 31.8	− 0 34.4	−0.7046	0.6017	0.1117	−14	−90
32 B. Scorpii	5.3	0.22	3.3	23 43.8	20 33.0	− 0 33.2	−1.2569	0.6018	0.1117	−56	−80
3 Scorpii	5.9	0.23	3.0	24 59.8	20 48.3	− 0 18.6	−0.0299	0.6020	0.1109	+22	−45
4 Scorpii	5.7	0.24	2.8	26 1.2	21 6.4	− 0 1.2	+0.9506	0.6021	0.1100	+64	+14
40 B. Scorpii	5.4	−0.24	− 3.2	−24 35.4	22 16.0	+ 1 5.5	−0.5905	0.6032	−0.1066	− 7	−85
π Scorpii	3.0	0.24	2.9	25 52.4	22 21.0	+ 1 10.2	+0.6711	0.6033	0.1064	+62	− 5
48 B. Scorpii	4.9	0.26	3.0	25 38.0	2 0 1.0	+ 2 45.9	+0.2590	0.6047	0.1014	+36	−28
50 B. Scorpii	6.4	0.25	3.3	24 29.8	0 14.3	+ 2 58.6	−0.8876	0.6048	0.1007	−25	−90
24 G. Scorpii	6.2	0.26	3.4	24 14.3	1 41.8	+ 4 22.5	−1.2850	0.6060	0.0963	−63	−69
65 B. Scorpii	5.5	−0.27	− 3.0	−26 6.2	1 45.8	+ 4 26.4	+0.5510	0.6060	−0.0961	+54	−12
85 B. Scorpii	6.0	0.28	3.4	25 15.9	4 15.3	+ 6 49.4	−0.5064	0.6080	0.0884	− 4	−77
σ Scorpii	3.1	0.30	3.5	25 23.6	6 32.8	+ 9 1.0	−0.5741	0.6096	0.0812	− 9	−84
α Scorpii	1.2	0.32	3.5	26 14.9	9 30.6	+11 51.2	+0.0421	0.6116	0.0717	+22	−40
22 Scorpii	4.8	0.32	3.7	24 55.9	9 49.0	−11 51.3	−1.2761	0.6118	0.0707	−62	−70
116 B. Scorpii	6.2	−0.33	− 3.5	−26 21.4	10 13.3	−11 28.0	+0.0994	0.6121	−0.0694	+25	−37
134 B. Scorpii	6.4	0.36	3.6	27 18.0	14 50.4	− 7 3.1	+0.7422	0.6147	−0.0542	+63	0
				NEW	*MOON.*						
Uranus	6.2	. . .	. . .	−17 15.4	6 18 18.4	− 7 46.3	+1.2762	0.5627	+0.2282	+73	+38
29 Capricorni	5.5	−0.14	− 4.4	−15 31.3	20 10.5	− 5 58.3	−0.0226	0.5629	+0.2314	+35	−44
λ Capricorni	5.5	0.05	3.2	11 45.3	7 9 40.3	+ 7 2.8	−0.5595	0.5502	0.2475	+10	−78
151 B. Capricorni	6.1	0.03	3.4	13 6.9	11 4.4	+ 8 24.0	+1.1574	0.5489	0.2488	+77	+25
96 B. Aquarii	6.5	−0.03	2.8	10 42.5	12 51.3	+10 7.2	−0.8213	0.5473	0.2504	− 4	−90
θ Aquarii	4.3	+0.05	1.7	8 12.1	23 31.6	− 3 34.0	−0.6427	0.5385	0.2582	+ 8	−85
150 B. Aquarii	6.0	+0.06	− 2.0	− 9 27.6	23 32.8	− 3 32.8	+0.6376	0.5385	+0.2582	+79	−10
ρ Aquarii	5.3	0.06	1.6	8 14.6	8 1 6.2	− 2 2.5	−0.1934	0.5373	0.2591	+31	−54
170 B. Aquarii	6.0	0.07	1.4	7 37.2	2 40.4	− 0 31.4	−0.4204	0.5361	0.2599	+20	−68
186 B. Aquarii	6.1	0.10	− 1.0	6 59.1	6 20.3	+ 3 1.3	−0.1117	0.5335	0.2616	+36	−49
252 B. Aquarii	5.8	0.20	+ 0.1	5 26.1	17 50.1	− 9 50.9	+1.3368	0.5261	0.2647	+83	+40
6 G. Piscium	6.2	+0.20	+ 0.9	− 2 50.7	19 21.0	− 8 22.7	−0.9239	0.5252	+0.2649	− 7	−90
22 B. Piscium	6.4	0.30	2.3	− 0 10.2	9 7 51.1	+ 3 44.0	−0.3812	0.5191	0.2645	+23	−65
κ Piscium	4.9	0.31	2.7	+ 0 47.8	9 33.2	+ 5 23.0	−0.9341	0.5183	0.2642	− 7	−89
9 Piscium	6.4	0.32	2.7	0 39.7	9 42.8	+ 5 32.3	−0.7524	0.5183	0.2642	+ 4	−89
16 Piscium	5.7	0.36	3.2	1 38.2	14 19.0	+10 0.1	−0.5552	0.5166	0.2631	+14	−77
λ Piscium	4.6	+0.39	+ 3.3	+ 1 19.1	17 10.5	−11 13.7	+0.5276	0.5156	+0.2622	+75	−16
19 Piscium	5.4	0.40	4.0	3 1.3	19 22.4	− 9 5.7	−0.6770	0.5150	0.2614	+ 8	−86
22 Piscium	5.8	0.43	3.9	2 27.9	22 12.1	− 6 21.2	+0.6438	0.5142	0.2603	+85	− 9
d Piscium	5.4	0.56	6.4	7 43.5	10 12 50.3	+ 7 50.9	−1.1437	0.5115	0.2522	−22	−82
136 B. Piscium	6.5	0.67	7.2	8 53.9	23 25.4	− 5 52.9	+0.2358	0.5110	0.2441	+56	−29
75 Piscium	6.3	+0.81	+ 9.0	+12 30.5	11 12 25.1	+ 6 43.6	−0.5297	0.5118	+0.2319	+15	−69
η Piscium	3.7	0.96	10.1	14 55.0	12 1 6.8	− 4 57.4	−0.2703	0.5140	0.2175	+28	−52
101 Piscium	6.2	0.99	9.9	14 14.1	3 17.8	− 2 50.4	+0.9381	0.5145	0.2148	+90	+13
105 Piscium	6.1	1.01	10.6	15 59.0	5 15.4	− 0 56.3	−0.5351	0.5149	0.2123	+14	−66
3 Arietis	6.4	1.05	11.0	16 59.7	8 44.2	+ 2 26.2	−0.9028	0.5158	0.2077	− 7	−73
4 Arietis	5.8	+1.06	+10.8	+16 32.5	9 32.6	+ 3 13.2	−0.2424	0.5160	+0.2067	+30	−49
ι Arietis	5.1	1.12	11.2	17 24.7	14 8.6	+ 7 40.7	−0.2522	0.5173	0.2003	+29	−49
35 B. Arietis	6.4	1.16	11.3	17 51.2	17 19.3	+10 45.6	−0.1041	0.5183	0.1958	+37	−40
47 B. Arietis	6.5	1.19	11.3	17 38.0	19 20.8	−11 16.6	+0.5294	0.5190	0.1928	+77	− 7
15 Arietis	5.9	1.21	11.8	19 6.5	20 45.1	− 9 54.9	−0.8095	0.5194	0.1907	− 2	−71
θ Arietis	5.6	+1.26	+11.9	+19 31.0	13 0 28.3	− 6 18.5	−0.5578	0.5207	+0.1850	+13	−64

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JANUARY.

The Star's						At Conjunction in R. A.						Limiting Parallels.	
Name.		Mag.	Red'ns from 1916.0.		Apparent Declination.	Greenwich Mean Time.		Hour Angle, *H*	*Y*	*x′*	*y′*	N.	S.
			Δα	Δδ									
			s	″	° ′	d	h m	h m				°	°
26	Arietis	6.2	+1.34	+11.8	+19 29.2	13	6 38.1	− 0 20.1	+0.5850	0.5228	+0.1751	+82	− 2
ν	Arietis	5.4	1.40	12 5	21 36.1		10 37.0	+ 3 31.2	−1.0495	0.5244	0.1685	−19	−68
ε	Arietis (*mean*)	4.6	1.53	12.0	21 0.5		20 30.7	−10 53.7	+1.1845	0.5281	0.1510	+90	+41
64	Arietis	5.8	1.71	12.7	24 25.9	14	8 26.9	+ 0 39.4	−0.9185	0.5328	0.1282	−11	−66
7	Tauri	5.9	1.78	12.4	24 11.2		13 14.2	+ 5 17.4	−0.0586	0.5346	0.1186	+40	−29
11	Tauri	6.1	+1.82	+12.4	+25 3.7		16 11.7	+ 8 9.1	−0.6845	0.5357	+0.1125	+ 4	−64
16	Tauri	5.4	1.84	12.0	24 1.8		18 5.9	+ 9 59.6	+0.6681	0.5364	0.1085	+90	+10
17	Tauri	3.8	1.84	12.0	23 51.2		18 8.0	+10 1.7	+0.8666	0.5364	0.1085	+90	+21
18	Tauri	5.6	1.85	12.2	24 34.8		18 15.4	+10 8.7	+0.0762	0.5364	0.1081	+47	−21
q	Tauri	4.3	1.84	12.1	24 12.5		18 17.0	+10 10.3	+0.4905	0.5365	0.1081	+76	+ 1
20	Tauri	4.1	+1.85	+12.1	+24 6.6		18 34.5	+10 27.2	+0.6311	0.5366	+0.1075	+90	+ 8
21	Tauri	5.8	1.85	12.1	24 17.8		18 36.6	+10 29.3	+0.4279	0.5366	0.1075	+71	− 3
22	Tauri	6.5	1.85	12.1	24 16.2		18 40.6	+10 33.1	+0.4642	0.5366	0.1073	+73	− 1
23	Tauri	4.3	1.85	11.9	23 41.4		18 48.9	+10 41.1	+1.1200	0.5366	0.1070	+90	+40
η	Tauri	3.0	1.86	11.9	23 51.0		19 21.2	+11 12.4	+1.0018	0.5368	0.1059	+90	+31
27	Tauri	3.7	+1.86	+11.8	+23 48.0		20 8.2	+11 57.8	+1.1383	0.5371	+0.1042	+90	+42
28	Tauri	5.2	1.87	11.9	23 53.1		20 8.8	+11 58.4	+1.0469	0.5371	0.1042	+90	+34
14 H.	Tauri	5.3	1.89	12.2	25 19.8		20 39.0	−11 32.3	−0.5011	0.5374	0.1032	+15	−52
p	Tauri	5.6	2.02	11.9	26 16.0	15	6 9.1	− 2 21.1	−0.6557	0.5405	0.0825	+ 5	−60
χ	Tauri	5.3	2.09	11.1	25 26.1		11 34.2	+ 2 53.1	+0.6799	0.5421	0.0704	+90	+15
17 B.	Aurigæ	6.0	+2.29	+10.4	+27 45.6	16	1 18.8	− 7 50.2	−1.1516	0.5453	+0.0386	−33	−62
38 B.	Aurigæ	6.5	2.35	9.7	27 34.9		6 41.5	− 2 38.4	−0.7801	0.5461	0.0259	− 3	−62
47 B.	Aurigæ	6.0	2.38	9.5	27 55.7		9 0.1	− 0 24.5	−1.1110	0.5464	0.0204	−29	−62
354 B.	Tauri	6.4	2.43	8.9	27 52.5		14 5.5	+ 4 30.4	−0.9798	0.5469	+0.0082	−17	−62
107 B.	Aurigæ	6.5	2.50	7.9	27 36.6		20 51.0	+11 2.2	−0.6845	0.5473	−0.0080	+ 3	−58
112 B.	Aurigæ	5.7	+2.49	+ 7.7	+26 52.5		21 24.9	+11 34.9	+0.1281	0.5473	−0.0093	+50	− 8
125	Tauri	5.1	2.48	7.4	25 51.2		22 36.3	−11 16.2	+1.2507	0.5473	0.0122	+76	+61
406 B.	Tauri	5.6	2.57	7.1	27 56.7	17	3 38.8	− 6 23.9	−1.1664	0.5472	0.0243	−35	−62
136	Tauri	4.6	2.57	6.9	27 35.7		4 43.3	− 5 21.6	−0.8044	0.5471	0.0268	− 4	−62
139	Tauri	4.7	2.55	6.3	25 56.8		6 52.0	− 3 17.3	+0.9644	0.5470	0.0320	+90	+36
415 B.	Tauri	6.1	+2.60	+ 6.4	+27 34.2		8 12.2	− 1 59.9	−0.8850	0.5469	−0.0351	−10	−62
ε	Geminorum	3.2	2.68	3.2	25 13.0	18	3 49.3	− 7 2.6	+0.5876	0.5437	0.0808	+85	+ 9
37	Geminorum	5.7	2.71	2.4	25 28.9		9 3.8	− 1 58.6	−0.1617	0.5423	0.0925	+34	−32
39	Geminorum	6.2	2.73	2.3	26 11.6		10 40.0	− 0 25.6	−1.1002	0.5418	0.0960	−26	−64
40	Geminorum	6.3	2.73	2.2	26 1.8		10 58.4	− 0 7.7	−0.9489	0.5417	0.0967	−14	−64
ω	Geminorum	5.2	+2.70	+ 1.8	+24 20.2		12 22.2	+ 1 13.2	+0.7897	0.5414	−0.0997	+90	+18
48	Geminorum	5.8	2.71	1.1	24 16.2		17 2.2	+ 5 44.0	+0.3736	0.5399	0.1098	+66	− 6
52	Geminorum	6.1	2.73	1.0	25 1.9		18 4.6	+ 6 44.3	−0.5848	0.5396	0.1120	+10	−58
A	Geminorum	5.1	2.75	0.4	25 12.8		22 11.4	+10 42.9	−1.2628	0.5381	0.1206	−46	−65
58	Geminorum	6.0	2.70	+ 0.3	23 6.5		22 13.3	+10 44.7	+1.0622	0.5381	0.1207	+90	+34
	B. D.+23° 1744	6.4	+2.71	− 0.4	+23 4.0	19	2 38.4	− 8 58.9	+0.5530	0.5365	−0.1297	+81	+ 2
187 B.	Geminorum	6.3	2.72	1.0	23 12.8		6 29.5	− 5 15.2	−0.1231	0.5350	0.1373	+36	−34
192 B.	Geminorum	6.3	2.71	1.2	22 35.9		7 38.5	− 4 8.4	+0.3977	0.5346	0.1395	+68	− 8
82	Geminorum	6.3	2.73	1.5	23 21.0		10 6.3	− 1 45.4	−0.7813	0.5336	0.1443	− 1	−67
μ	Cancri	5.5	2.70	2.9	21 49.5		19 22.5	+ 7 13.0	−0.5173	0.5298	0.1614	+14	−59
	NEPTUNE	7.7	. . .	. . .	+19 34.3	20	0 48.2	−11 31.5	+1.0625	0.5288	−0.1711	+90	+28
49 B.	Cancri	6.0	+2.68	− 3.8	21 0.7		1 31.2	−10 49.9	−0.6457	0.5272	0.1720	+ 8	−67
θ	Cancri	5.5	2.62	4.5	18 22.7		7 5.8	− 5 25.7	+1.2663	0.5249	0.1811	+86	+45
102 B.	Cancri	6.5	2.65	5.1	19 58.0		11 25.4	− 1 14.1	−1.2769	0.5231	0.1879	−40	−70
ε	Cancri	6.3	2.64	5.1	19 50.5		11 28.0	− 1 11.6	−1.1478	0.5231	0.1879	−26	−70
δ	Cancri	4.2	+2.61	− 5.4	+18 27.7		13 35.7	+ 0 52.1	−0.0374	0.5222	−0.1911	+41	−36
X	Cancri (*var.*)	6.2	2.58	6.0	17 33.0		18 58.2	+ 6 4.8	−0.0854	0.5200	0.1989	+38	−39
81	Cancri	6.4	2.52	6.9	15 20.0	21	3 35.4	− 9 33.6	+0.5754	0.5166	0.2104	+81	− 7
π	Cancri	5.6	2.51	7.1	15 17.3		5 4.0	− 8 7.7	+0.3121	0.5161	0.2122	+61	−21
227 B.	Cancri	6.4	2.51	7.5	15 43.6		8 8.7	− 5 8.6	−0.8250	0.5149	0.2159	− 2	−74
18	*Leonis*	5.8	+2.40	− 8.6	+12 11.7		21 10.7	+ 7 30.4	+0.1160	0.5107	−0.2300	+49	−33

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JANUARY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1916.0. Δα	Red'ns from 1916.0. Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x′	y′	N.	S.
		s	″	° ′	d h m	h m				°	°
Leonis	6.4	+2.39	− 8.6	+11 57.3	21 21 43.5	+ 8 2.2	+0.2513	0.5106	−0.2305	+57	−26
Leonis (*var.*)	5–10	2.39	8.6	11 49.0	21 47.4	+ 8 6.0	+0.3866	0.5105	0.2306	+66	−19
Leonis	4.6	2.32	9.4	10 24.4	22 8 28.1	− 5 31.9	−0.5956	0.5079	0.2398	+12	−75
Leonis	6.3	2.23	9.6	6 58.0	16 27.7	+ 2 13.8	+1.1868	0.5064	0.2456	+90	+27
Leonis	5.2	2.20	10.2	7 23.0	22 42.5	+ 8 17.8	−0.8100	0.5056	0.2493	0	−83
Sextantis	6.1	+2.14	−10.2	+ 5 11.2	23 3 15.1	−11 17.4	+0.4208	0.5052	−0.2516	+67	−20
Leonis	5.0	2.07	10.6	4 3.9	12 23.8	− 2 24.5	−0.6927	0.5050	0.2553	+ 7	−86
Leonis	5.7	2.03	10.4	2 24.5	15 47.3	+ 0 53.2	+0.2174	0.5051	0.2563	+55	−31
Leonis	5.4	2.00	10.8	2 28.2	21 16.0	+ 6 12.5	−1.2542	0.5055	0.2575	−31	−88
Leonis	6.0	1.99	10.8	2 6.5	22 8.0	+ 7 3.0	−1.0902	0.5056	0.2576	−17	−88
B. Leonis	6.3	+1.96	−10.6	+ 0 35.4	24 0 27.3	+ 9 18.4	−0.0654	0.5059	−0.2579	+39	−46
B. Leonis	6.3	1.93	10.2	− 1 14.4	2 53.0	+11 39.9	+1.2622	0.5063	0.2582	+89	+32
Leonis	4.5	1.90	10.7	0 21.8	7 38.5	− 7 42.9	−0.9029	0.5072	0.2583	− 5	−90
B. Leonis	6.2	1.88	10.4	1 58.5	8 24.5	− 6 58.2	+0.6157	0.5073	0.2583	+82	−11
B. Virginis	6.5	1.72	10.3	5 15.3	25 3 0.6	+11 5.0	−0.6861	0.5131	0.2549	+ 6	−89
Virginis	5.3	+1.62	− 9.6	− 8 59.5	12 54.1	− 3 19.4	+0.7529	0.5177	−0.2504	+81	− 3
B. Virginis	6.0	1.52	9.2	11 11.8	23 5.6	+ 6 33.2	+0.5442	0.5235	0.2438	+71	−14
Virginis	4.9	1.36	8.1	15 32.5	26 15 0.0	− 2 3.1	+1.3046	0.5345	0.2289	+74	+40
Virginis	5.6	1.34	8.4	14 56.0	17 31.5	+ 0 23.9	+0.0968	0.5365	0.2259	+42	−38
Virginis	5.6	1.28	8.2	15 45.6	22 54.2	+ 5 35.8	−0.2441	0.5408	0.2193	+24	−57
Virginis	6.1	+1.28	− 8.3	−15 20.9	23 24.4	+ 6 4.9	−0.7799	0.5412	−0.2186	− 5	−90
Virginis	5.8	1.27	7.6	17 26.5	27 0 13.7	+ 6 52.6	+1.2074	0.5419	0.2175	+73	+30
Virginis	5.1	1.26	7.5	17 43.1	1 21.0	+ 7 57.7	+1.2492	0.5429	0.2160	+72	+35
H. Virginis	5.5	1.14	7.7	17 48.7	12 45.9	− 5 1.0	−1.0252	0.5529	0.1987	−24	−90
G. Virginis	6.4	1.13	7.6	18 11.8	13 29.3	− 4 19.1	−0.7714	0.5536	0.1974	− 7	−90
G. Virginis	5.7	+1.12	− 7.5	−18 19.8	14 10.8	− 3 39.2	−0.7715	0.5542	−0.1963	− 7	−90
G. Libræ	6.5	1.05	7.0	20 4.4	21 9.7	+ 3 4.9	−0.3082	0.5606	0.1837	+16	−61
G. Libræ	6.4	1.00	6.8	20 49.3	28 1 57.5	+ 7 42.1	−0.4000	0.5652	0.1743	+10	−68
G. Libræ	6.1	0.99	6.7	20 58.5	2 23.6	+ 8 7.2	−0.3197	0.5656	0.1734	+14	−62
B. Libræ	5.7	0.95	6.8	21 2.4	6 37.0	−11 48.8	−0.9660	0.5695	0.1645	−23	−90
G. Libræ	6.1	+0.91	− 6.5	−21 42.4	10 20.8	− 8 13.4	−0.8827	0.5730	−0.1563	−19	−90
G. Libræ	5.8	0.86	6.4	22 5.5	14 22.8	− 4 20.6	−1.1028	0.5767	0.1469	−35	−90
B. Libræ	6.3	0.79	5.7	24 12.4	21 3.2	+ 2 4.2	+0.1172	0.5828	0.1305	+32	−36
Libræ	5.0	0.76	5.9	23 32.8	23 52.2	+ 4 46.5	−0.9063	0.5852	0.1232	−24	−90
Scorpii	4.7	0.71	5.3	25 29.9	29 4 1.0	+ 8 45.5	+0.5764	0.5887	0.1121	+57	−11
Scorpii	4.6	+0.70	− 5.4	−25 4.7	5 2.6	+ 9 44.5	+0.0392	0.5895	−0.1093	+26	−41
B. Scorpii	5.4	0.70	5.7	24 17.1	5 9.8	+ 9 51.4	−0.7740	0.5897	0.1089	−17	−90
Scorpii	5.9	0.70	5.4	24 59.8	5 26.9	+10 7.9	−0.0871	0.5899	0.1082	+19	−48
Scorpii	5.7	0.70	5.1	26 1.2	5 45.7	+10 25.9	+0.9112	0.5901	0.1073	+64	+10
B. Scorpii	5.4	0.68	5.6	24 35.5	6 57.9	+11 35.1	−0.6567	0.5911	0.1039	−11	−90
Scorpii	3.0	+0.68	− 5.2	−25 52.5	7 3.2	+11 40.3	+0.6274	0.5912	−0.1037	+60	− 7
B. Scorpii	4.9	0.66	5.3	25 38.0	8 47.0	−10 40.3	+0.2090	0.5925	0.0988	+34	−31
B. Scorpii	6.4	0.66	5.6	24 29.8	9 0.8	−10 26.9	−0.9579	0.5927	0.0982	−30	−90
B. Scorpii	5.5	0.64	5.1	26 6.2	10 35.8	− 8 55.8	+0.5073	0.5939	0.0936	+51	−14
B. Scorpii	6.0	0.62	5.4	25 16.0	13 11.0	− 6 26.9	−0.5673	0.5958	0.0861	− 8	−83
Scorpii	3.1	+0.59	− 5.3	−25 23.6	15 33.7	− 4 10.1	−0.6347	0.5974	−0.0790	−12	−90
Scorpii	1.2	0.56	5.1	26 14.9	18 38.2	− 1 13.3	−0.0059	0.5995	0.0697	+20	−43
B. Scorpii	6.2	0.55	5.0	26 21.4	19 22.5	− 0 30.8	+0.0528	0.5999	0.0675	+23	−40
B. Scorpii	6 4	0.50	4.8	27 18.0	30 0 10.0	+ 4 4.5	+0.7095	0.6028	0.0526	+62	− 2
B. Ophiuchi	6.2	0.42	5.0	26 24.1	8 30.0	−11 56.7	−0.5161	0.6066	0.0258	−10	−78
G. Ophiuchi	6.1	+0.40	− 4.7	−27 39.6	10 30.3	−10 1.6	+0.6938	0.6074	−0.0193	+60	− 3
Ophi. (*1st star*)	5.4	0.39	5.1	26 28.9	11 36.6	− 8 58.1	−0.5003	0.6078	0.0157	−10	−77
Ophiuchi	5.4	0.37	4.6	28 3.8	14 29.4	− 6 12.7	+1.0438	0.6086	0.0062	+62	+22
G. Ophiuchi	6.3	0.35	5.1	25 52.3	15 49.1	− 4 56.4	−1.1441	0.6089	−0.0018	−52	−90
G. Ophiuchi	6.0	0.34	5.0	26 12.5	17 33.9	− 3 16.1	−0.8071	0.6094	+0.0040	−28	−90
G. Ophiuchi	6.3	+0.30	− 4.6	−27 50.8	21 44.1	+ 0 43.3	+0.8675	0.6100	+0.0179	+62	+ 8

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JANUARY.

	THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
	Name.	Mag.	Red'ns from 1916.0. Δα	Red'ns from 1916.0. Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle, *H*	*Y*	*x′*	*y′*	N.	S.
			s	″	° ′	d h m	h m				°	°
χ	Sagittarii (*var.*)	4.4	+0.29	− 4.6	−27 48.1	**30** 23 17.0	+ 2 12.1	+0.8544	0.6101	+0.0231	+62	+ 8
4 G.	Sagittarii	6.2	0.28	4.8	26 56.8	23 37.4	+ 2 31.8	+0.0146	0.6102	0.0242	+18	−42
10 G.	Sagittarii	5.7	0.26	4.6	28 3.2	**31** 2 35.5	+ 5 22.0	+1.1989	0.6103	0.0341	+62	+40
66 B.	Sagittarii	4.7	0.20	4.7	27 4.5	10 21.7	−11 11.9	+0.5919	0.6097	0.0598	+54	− 9
67 B.	Sagittarii	6.4	0.20	5.1	25 38.3	10 37.0	−10 57.3	−0.8159	0.6096	0.0606	−24	−90
68 G.	Sagittarii	6.2	+0.18	− 4.8	−26 41.2	13 53.6	− 7 49.1	+0.4384	0.6090	+0.0713	+45	−18
λ	Sagittarii	2.9	0.18	5.1	25 28.2	14 0.0	− 7 43.0	−0.7581	0.6090	0.0716	−20	−90
69 G.	Sagittarii	6.3	0.18	4.8	26 48.6	14 1.7	− 7 41.4	+0.5698	0.6090	0.0717	+53	−10
86 B.	Sagittarii	6.5	0.18	4.8	26 38.3	14 20.4	− 7 23.4	+0.4217	0.6089	0.0727	+44	−19
126 B.	Sagittarii	5.7	0.14	5.0	25 5.9	20 10.3	− 1 48.6	−0.6234	0.6071	0.0913	−11	−89
σ	Sagittarii	2.1	+0.13	− 4.8	−26 24.2	23 59.8	+ 1 51.1	+1.0403	0.6056	+0.1033	+64	+21

FEBRUARY.

	Name.	Mag.	Δα	Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle, *H*	*Y*	*x′*	*y′*	N.	S.
162 B.	Sagittarii	6.4	+0.12	− 5.0	−24 59.5	**1** 1 9.2	+ 2 57.7	−0.2348	0.6051	+0.1068	+11	−57
127 G.	Sagittarii	6.4	+0.11	− 5.0	−25 3.7	1 55.1	+ 3 41.6	−0.0830	0.6048	+0.1092	+19	−48
172 B.	Sagittarii	5.8	0.11	5.0	24 57.9	2 40.9	+ 4 25.5	−0.0940	0.6044	0.1115	+19	−48
					NEW	*MOON.*						
252 B.	Aquarii	5.8	+0.10	− 1.0	− 5 26.1	**5** 4 19.4	+ 2 26.6	+1.3484	0.5335	+0.2686	+82	+41
6 G.	Piscium	6.2	+0.09	− 0.4	− 2 50.7	5 48.2	+ 3 52.6	−0.8899	0.5328	+0.2688	− 5	−90
22 B.	Piscium	6.4	0.15	+ 0.8	− 0 10.2	17 59.2	− 8 19.7	−0.3506	0.5272	0.2687	+25	−63
κ	Piscium	4.9	0.15	1.1	+ 0 47.8	19 38.6	− 6 43.4	−0.8971	0.5266	0.2685	− 5	−89
9	Piscium	6.4	0.15	1.1	0 39.7	19 47.9	− 6 34.4	−0.7175	0.5266	0.2684	+ 6	−89
16	Piscium	5.7	0.17	1.6	1 38.2	**6** 0 16.6	− 2 14.3	−0.5219	0.5250	0.2674	+16	−75
λ	Piscium	4.6	+0.20	+ 1.6	+ 1 19.1	3 3.4	+ 0 27.3	+0.5483	0.5241	+0.2665	+77	−14
19	Piscium	5.4	0.20	2.2	3 1.3	5 11.6	+ 2 31.6	−0.6418	0.5235	0.2657	+10	−84
22	Piscium	5.8	0.23	2.2	2 27.8	7 56.5	+ 5 11.3	+0.6631	0.5227	0.2646	+87	− 8
d	Piscium	5.4	0.30	4.4	7 43.5	22 9.5	− 5 2.0	−1.1026	0.5201	0.2563	−18	−82
136 B.	Piscium	6.5	0.39	5.2	8 53.9	**7** 8 26.4	+ 4 56.0	+0.2588	0.5193	0.2479	+57	−27
75	Piscium	6.3	+0.50	+ 6.9	+12 30.5	21 4.5	− 6 49.0	−0.4990	0.5195	+0.2352	+17	−68
η	Piscium	3.7	0.62	8.2	14 54.7	**8** 9 26.5	+ 5 10.1	−0.2450	0.5209	0.2203	+30	−50
101	Piscium	6.2	0.65	8.0	14 14.1	11 34.2	+ 7 13.9	+0.9491	0.5212	0.2174	+90	+14
105	Piscium	6.1	0.66	8.7	15 59.0	13 29.0	+ 9 5.1	−0.5076	0.5216	0.2149	+16	−65
3	Arietis	6.4	0.70	9.1	16 59.7	16 52.9	−11 37.2	−0.8721	0.5222	0.2101	− 5	−73
4	Arietis	5.8	+0.71	+ 9.0	+16 32.4	17 40.2	−10 51.4	−0.2191	0.5223	+0.2090	+31	−48
ι	Arietis	5.1	0.76	9.4	17 24.6	22 9.9	− 6 30.2	−0.2298	0.5232	0.2024	+31	−47
35 B.	Arietis	6.4	0.80	9.6	17 51.2	**9** 1 16.5	− 3 29.4	−0.0840	0.5240	0.1977	+38	−39
47 B.	Arietis	6.5	0.83	9.6	17 37.9	3 15.4	− 1 34.3	+0.5426	0.5245	0.1946	+78	− 8
15	Arietis	5.9	0.84	10.1	19 6.4	4 38.0	− 0 14.2	−0.7829	0.5248	0.1925	0	−71
θ	Arietis	5.6	+0.89	+10.3	+19 31.0	8 16.7	+ 3 17.6	−0.5348	0.5257	+0.1866	+15	−63
26	Arietis	6.2	0.97	10.4	19 29.2	14 19.6	+ 9 9.1	+0.5958	0.5274	0.1764	+84	− 1
ν	Arietis	5.4	1.02	11.1	21 36.1	18 14.4	−11 3.7	−1.0249	0.5285	0.1696	−17	−68
ε	Arietis (*mean*)	4.6	1.16	11.0	21 0.5	**10** 3 59.0	− 1 37.7	+1.1883	0.5314	0.1517	+90	+41
64	Arietis	5.8	1.35	11.9	24 25.8	15 46.2	+ 9 46.4	−0.9017	0.5349	0.1285	− 9	−66
7	Tauri	5.9	+1.42	+11.7	+24 11.2	20 30.6	− 9 38.5	−0.0486	0.5363	+0.1188	+40	−28
11	Tauri	6.1	1.47	11.8	25 3.7	23 26.5	− 6 48.5	−0.6713	0.5372	0.1126	+ 5	−63
16	Tauri	5.4	1.49	11.4	24 1.8	**11** 1 19.7	− 4 59.0	+0.6728	0.5377	0.1086	+90	+10
17	Tauri	3.8	1.49	11.4	23 51.2	1 21.8	− 4 57.0	+0.8702	0.5377	0.1085	+90	+22
18	Tauri	5.6	1.50	11.6	24 34.8	1 29.2	− 4 50.0	+0.0844	0.5378	0.1083	+48	−20
q	Tauri	4.3	+1.49	+11.5	+24 12.5	1 30.8	− 4 48.4	+0.4963	0.5377	+0.1082	+76	+ 1
20	Tauri	4.1	1.50	11.4	24 6.6	1 48.1	− 4 31.6	+0.6360	0.5378	0.1076	+90	+ 8
21	Tauri	5.8	1.50	11.5	24 17.8	1 50.2	− 4 29.5	+0.4340	0.5378	0.1075	+71	− 2
22	Tauri	6.5	1.50	11.5	24 16.2	1 54.1	− 4 25.8	+0.4701	0.5379	0.1074	+74	0
23	Tauri	4.3	1.50	11.3	23 41.4	2 2.4	− 4 17.8	+1.1221	0.5379	0.1071	+90	+40
η	*Tauri*	*3.0*	+1.51	+11.3	+23 51.0	2 34.4	− 3 46.8	+1.0045	0.5381	+0.1059	+90	+31

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

FEBRUARY.

The Star's					At Conjunction in R. A.						Limiting Parallels.	
Name.	Mag.	Red'ns from 1916.0.		Apparent Declination.	Greenwich Mean Time.		Hour Angle, H	Y	x'	y'	N.	S.
		Δα	Δδ									
		s	″	° ′	d	h m	h m				°	°
Tauri	3.7	+1.52	+11.3	+23 48.0	11	3 21.1	– 3 1.6	+1.1403	0.5383	+0.1043	+90	+42
Tauri	5.2	1.52	11.3	23 53.0		3 21.7	– 3 1.0	+1.0494	0.5383	0.1043	+90	+35
H. Tauri	5.3	1.54	11.8	25 19.8		3 51.6	– 2 32.2	–0.4902	0.5384	0.1032	+15	–51
Tauri	5.6	1.69	11.6	26 16.0		13 18.0	+ 6 35.4	–0.6462	0.5408	0.0824	+ 6	–60
Tauri	5.3	1.77	11.0	25 26.1		18 41.5	+11 48.0	+0.6825	0.5420	0.0702	+90	+15
B. Aurigæ	6.0	+2.00	+10.7	+27 45.7	12	8 23.7	+ 1 2.4	–1.1445	0.5444	+0.0384	–32	–62
B. Aurigæ	6.5	2.08	10.1	27 34.9		13 46.1	+ 6 13.9	–0.7752	0.5450	0.0257	– 2	–62
B. Aurigæ	6.0	2.12	10.0	27 55.7		16 4.6	+ 8 27.6	–1.1056	0.5451	0.0202	–28	–62
B. Tauri	6.4	2.19	9.5	27 52.5		21 10.0	–10 37.3	–0.9757	0.5454	+0.0081	–17	–62
B. Aurigæ	6.5	2.28	8.7	27 36.6	13	3 55.7	– 4 5.6	–0.6820	0.5456	–0.0081	+ 3	–58
B. Aurigæ	5.7	+2.28	+ 8.4	+26 52.5		4 29.6	– 3 32.8	+0.1287	0.5456	–0.0094	+51	– 8
Tauri	5.1	2.28	7.9	25 51.2		5 41.0	– 2 23.8	+1.2488	0.5456	0.0122	+77	+61
B. Tauri	5.6	2.38	7.9	27 56.8		10 44.0	+ 2 28.9	–1.1637	0.5454	0.0243	–35	–62
Tauri	4.6	2.39	7.7	27 35.7		11 48.5	+ 3 31.1	–0.8026	0.5453	0.0268	– 4	–62
Tauri	4.7	2.38	6.9	25 56.8		13 57.4	+ 5 35.7	+0.9626	0.5452	0.0319	+90	+36
B. Tauri	6.1	+2.43	+ 7.2	+27 34.3		15 17.7	+ 6 53.2	–0.8832	0.5450	–0.0351	–10	–62
Geminorum	3.2	2.61	3.9	25 13.0	14	10 56.7	+ 1 52.4	+0.5863	0.5420	0.0805	+85	+ 9
Geminorum	5.7	2.66	3.2	25 29.0		16 11.6	+ 6 56.8	–0.1618	0.5408	0.0922	+34	–31
Geminorum	6.2	2.70	3.1	26 11.6		17 47.9	+ 8 29.8	–1.0986	0.5404	0.0957	–26	–64
Geminorum	6.3	2.70	3.0	26 1.8		18 6.4	+ 8 47.8	–0.9475	0.5403	0.0964	–14	–64
Geminorum	5.2	+2.67	+ 2.4	+24 20.2		19 30.3	+10 8.9	+0.7880	0.5399	–0.0994	+90	+18
Geminorum	5.8	2.71	1.7	24 16.2	15	0 10.5	– 9 20.2	+0.3729	0.5386	0.1095	+66	– 5
Geminorum	6.1	2.74	1.7	25 1.9		1 12.8	– 8 19.9	–0.5837	0.5383	0.1117	+10	–58
Geminorum	5.1	2.77	1.1	25 12.8		5 19.7	– 4 21.1	–1.2600	0.5371	0.1203	–45	–65
Geminorum	6.0	2.73	+ 0.7	23 6.5		5 21.6	– 4 19.3	+1.0604	0.5371	0.1203	+90	+34
B. D.+23° 1744	6.4	+2.76	0.0	+23 4.1		9 46.6	– 0 3.0	+0.5526	0.5357	–0.1294	+81	+ 2
B. Geminorum	6.3	2.79	– 0.5	23 12.8		13 37.6	+ 3 40.5	–0.1217	0.5344	0.1370	+36	–34
B. Geminorum	6.3	2.78	0.8	22 35.9		14 46.5	+ 4 47.2	+0.3981	0.5340	0.1393	+68	– 7
Geminorum	6.3	2.81	1.0	23 21.0		17 14.1	+ 7 10.0	–0.7780	0.5332	0.1440	– 1	–67
Cancri	5.5	2.83	2.8	21 49.5	16	2 29.1	– 7 52.8	–0.5130	0.5299	0.1612	+15	–58
NEPTUNE	7.7	. . .	. . .	+19 44.3		6 24.3	– 4 5.0	+1.1326	0.5297	–0.1685	+90	+34
B. Cancri	6.0	+2.84	– 3.8	21 0.7		8 36.5	– 1 57.0	–0.6398	0.5277	0.1720	+ 8	–67
Cancri	5.5	2.81	5.0	18 22.7		14 9.6	+ 3 25.6	+1.2674	0.5258	0.1812	+90	+46
B. Cancri	6.5	2.85	5.4	19 58.0		18 27.8	+ 7 35.8	–1.2663	0.5242	0.1881	–39	–70
Cancri	6.3	2.85	5.4	19 50.5		18 30.4	+ 7 38.3	–1.1376	0.5242	0.1881	–25	–70
Cancri	4.2	+2.83	– 5.9	+18 27.7		20 37.4	+ 9 41.4	–0.0306	0.5235	–0.1914	+41	–35
B. Cancri	6.1	2.85	6.2	19 8.7		23 37.8	–11 23.7	–1.3585	0.5224	0.1959	–60	–64
Cancri (*var.*)	6.2	2.83	6.7	17 33.0	17	1 57.7	– 9 8.1	–0.0770	0.5216	0.1993	+39	–39
Cancri	6.4	2.80	8.1	15 20.0		10 30.9	– 0 50.5	+0.5836	0.5189	0.2110	+81	– 7
Cancri	5.6	2.80	8.3	15 17.3		11 58.7	+ 0 34.7	+0.3218	0.5184	0.2129	+62	–20
B. Cancri	6.4	+2.81	– 8.6	+15 43.6		15 1.8	+ 3 32.1	–0.8093	0.5175	–0.2167	– 1	–74
Leonis	5.8	2.76	10.4	12 11.7	18	3 55.5	– 7 57.3	+0.1321	0.5141	0.2311	+50	–32
Leonis	6.4	2.75	10.5	11 57.3		4 27.9	– 7 25.9	+0.2668	0.5140	0.2317	+58	–26
Leonis (*var.*)	5–10	2.75	10.5	11 49.0		4 31.8	– 7 22.1	+0.4015	0.5140	0.2317	+67	–19
Leonis	4.6	2.72	11.7	10 24.4		15 4.5	+ 2 52.0	–0.5715	0.5118	0.2413	+13	–74
Leonis	6.3	+2.66	–12.5	+ 6 58.0		22 57.6	+10 31.2	+1.2047	0.5107	–0.2473	+90	+28
Leonis	5.2	2.66	13.1	7 23.0	19	5 7.1	– 7 30.1	–0.7784	0.5102	0.2511	+ 2	–83
Sextantis	6.1	2.62	13.4	5 11.1		9 35.8	– 3 9.1	+0.4477	0.5099	0.2535	+69	–19
Leonis	5.0	2.59	14.1	4 3.9		18 36.2	+ 5 35.4	–0.6554	0.5099	0.2573	+ 9	–84
Leonis	5.7	2.56	14.2	2 24.5		21 56.6	+ 8 50.0	+0.2513	0.5101	0.2583	+57	–30
Leonis	5.4	+2.55	–14.6	+ 2 28.1	20	3 20.4	– 9 55.7	–1.2101	0.5106	–0.2596	–27	–88
Leonis	6.0	2.54	14.6	2 6.4		4 11.6	– 9 5.9	–1.0465	0.5107	0.2597	–14	–88
B. Leonis	6.3	2.52	14.6	+ 0 35.4		6 28.8	– 6 52.8	–0.0259	0.5109	0.2600	+42	–44
B. Leonis	6.3	2.50	14.6	– 1 14.5		8 52.3	– 4 33.4	+1.2963	0.5113	0.2602	+89	+35
Leonis	4.5	2.49	15.0	0 21.8		13 33.7	– 0 0.4	–0.8560	0.5122	0.2604	– 2	–90
B. Leonis	6.2	+2.47	–14.8	– 1 58.5		14 19.0	+ 0 43.7	+0.6558	0.5123	–0.2604	+85	–

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

FEBRUARY.

THE STAR'S					AT CONJUNCTION IN R. A.						Limiting Parallels.	
Name.	Mag.	Red'ns from 1916.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, *H*	*Y*	*x′*	*y′*	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
78 B. Virginis	6.5	+2.38	-15.1	- 5 15.4	**21** 8 40.3	- 5 28.0	-0.6322	0.5176	-0.2566	+ 9	-84
q Virginis	5.3	2.31	14.7	8 59.6	18 27.2	+ 4 1.1	+0.8070	0.5217	0.2518	+81	0
χ Virginis	4.8	2.30	15.1	7 32.3	21 10.1	+ 6 39.0	-1.4005	0.5229	0.2502	-56	-71
370 B. Virginis	6.0	2.25	14.4	11 11.8	**22** 4 33.4	-10 11.6	+0.6035	0.5267	0.2448	+75	-11
69 Virginis	4.9	2.16	13.4	15 32.5	20 23.0	+ 5 7.6	+1.3714	0.5363	0.2292	+69	+54
75 Virginis	5.6	+2.14	-13.6	-14 56.1	22 54.8	+ 7 34.5	+0.1633	0.5380	-0.2262	+46	-34
83 Virginis	5.6	2.10	13.3	15 45.6	**23** 4 17.3	-11 13.8	-0.1767	0.5417	0.2193	+27	-53
85 Virginis	6.1	2.10	13.4	15 21.0	4 47.6	-10 44.5	-0.7137	0.5421	0.2186	- 1	-90
87 Virginis	5.8	2.10	12.8	17 26.6	5 36.9	- 9 56.9	+1.2785	0.5427	0.2174	+73	+38
89 Virginis	5.1	2.09	12.7	17 43.2	6 44.4	- 8 51.6	+1.3210	0.5434	0.2159	+72	+45
43 H. Virginis	5.5	+2.01	-12.5	-17 48.8	18 12.0	+ 2 12.4	-0.9585	0.5520	-0.1981	-18	-90
231 G. Virginis	6.4	2.00	12.4	18 11.9	18 55.7	+ 2 54.6	-0.7035	0.5526	0.1968	- 3	-90
236 G. Virginis	5.7	2.00	12.3	18 19.8	19 37.4	+ 3 34.8	-0.7036	0.5532	0.1956	- 3	-90
9 G. Libræ	6.5	1.94	11.6	20 4.5	**24** 2 39.9	+10 22.4	-0.2374	0.5587	0.1828	+19	-57
17 G. Libræ	6.4	1.90	11.2	20 49.4	7 30.8	- 8 57.2	-0.3295	0.5625	0.1732	+14	-63
18 G. Libræ	6.1	+1.90	-11.1	-20 58.6	7 57.3	- 8 31.7	-0.2486	0.5628	-0.1723	+18	-57
43 B. Libræ	5.7	1.88	11.2	21 2.5	12 13.9	- 4 24.5	-0.8994	0.5662	0.1634	-19	-90
47 G. Libræ	6.1	1.83	10.6	21 42.5	16 1.0	- 0 45.8	-0.8159	0.5692	0.1550	-15	-90
64 G. Libræ	5.8	1.80	10.3	22 5.5	20 7.0	+ 3 11.0	-1.0382	0.5723	0.1456	-30	-90
153 B. Libræ	6.3	1.74	9.2	24 12.4	**25** 2 54.8	+ 9 43.2	+0.1926	0.5773	0.1291	+36	-32
42 Libræ	5.0	+1.71	- 9.3	-23 32.9	5 47.3	-11 30.9	-0.8413	0.5793	-0.1219	-20	-90
b Scorpii	4.7	1.68	8.4	25 30.0	10 1.6	- 7 26.7	+0.6569	0.5822	0.1108	+62	- 6
A Scorpii	4.6	1.66	8.5	25 4.8	11 4.5	- 6 26.2	+0.1138	0.5830	0.1080	+30	-36
31 B. Scorpii	5.4	1.66	8.8	24 17.2	11 11.9	- 6 19.1	-0.7084	0.5831	0.1077	-13	-90
32 B. Scorpii	5.3	1.65	9.0	23 43.9	11 13.1	- 6 18.0	-1.2768	0.5831	0.1077	-59	-75
3 Scorpii	5.9	+1.66	- 8.5	-24 59.9	11 29.4	- 6 2.2	-0.0139	0.5832	-0.1069	+23	-44
4 Scorpii	5.7	1.66	8.1	26 1.3	11 48.6	- 5 43.8	+0.9955	0.5835	0.1060	+64	+17
40 B. Scorpii	5.4	1.64	8.6	24 35.5	13 2.5	- 4 32.9	-0.5902	0.5843	0.1027	- 7	-85
π Scorpii	3.0	1.65	8.1	25 52.5	13 7.9	- 4 27.6	+0.7086	0.5843	0.1025	+64	- 2
48 B. Scorpii	4.9	1.63	8.1	25 38.1	14 54.2	- 2 45.6	+0.2853	0.5855	0.0976	+38	-27
50 B. Scorpii	6.4	+1.62	- 8.5	-24 29.9	15 8.4	- 2 31.9	-0.8951	0.5856	-0.0970	-25	-90
65 B. Scorpii	5.5	1.61	7.8	26 6.3	16 45.8	- 0 58.3	+0.5871	0.5866	0.0924	+56	-10
85 B. Scorpii	6.0	1.57	8.0	25 16.0	19 24.9	+ 1 34.4	-0.5007	0.5882	0.0850	- 4	-77
σ Scorpii	3.1	1.55	7.8	25 23.7	21 51.4	+ 3 55.0	-0.5695	0.5895	0.0780	- 9	-83
α Scorpii	1.2	1.52	7.3	26 14.9	**26** 1 1.0	+ 6 57.0	+0.0669	0.5912	0.0688	+24	-38
116 B. Scorpii	6.2	+1.51	- 7.2	-26 21.5	1 46.5	+ 7 40.7	+0.1263	0.5915	-0.0666	+26	-35
134 B. Scorpii	6.4	1.46	6.6	27 18.1	6 42.2	-11 35.7	+0.7912	0.5938	0.0519	+63	+ 3
118 B. Ophiuchi	6.2	1.36	6.4	26 24.1	15 17.6	- 3 21.5	-0.4532	0.5969	0.0256	- 7	-73
95 G. Ophiuchi	6.1	1.35	5.8	27 39.6	17 21.8	- 1 22.4	+0.7740	0.5974	0.0192	+62	+ 2
36 Ophi. (*1st star*)	5.4	1.32	6.3	26 28.9	18 30.2	- 0 16.9	-0.4378	0.5977	0.0156	- 7	-72
43 Ophiuchi	5.4	+1.30	- 5.4	-28 3.8	21 28.6	+ 2 34.1	+1.1286	0.5984	-0.0063	+62	+31
136 G. Ophiuchi	6.3	1.27	6.0	25 52.3	22 51.0	+ 3 53.2	-1.0927	0.5986	-0.0020	-47	-90
151 G. Ophiuchi	6.0	1.25	5.8	26 12.5	**27** 0 39.3	+ 5 36.9	-0.7512	0.5989	+0.0037	-25	-90
163 G. Ophiuchi	6.3	1.21	5.0	27 50.8	4 58.1	+ 9 44.9	+0.9480	0.5993	0.0173	+62	+15
X Sagittarii (*var.*)	4.4	1.19	4.9	27 48.1	6 34.1	+11 16.9	+0.9343	0.5994	0.0224	+62	+14
4 G. Sagittarii	6.2	+1.18	- 5.2	-26 56.9	6 55.3	+11 37.2	+0.0812	0.5994	+0.0235	+20	-38
66 B. Sagittarii	4.7	1.06	4.4	27 4.5	18 2.2	- 1 43.6	+0.6640	0.5985	0.0583	+59	- 5
67 B. Sagittarii	6.4	1.04	4.9	25 38.3	18 18.0	- 1 28.5	-0.7665	0.5985	0.0591	-21	-90
68 G. Sagittarii	6.2	1.01	4.3	26 41.2	21 41.5	+ 1 46.6	+0.5066	0.5978	0.0695	+49	-15
λ Sagittarii	2.9	1.00	4.7	25 28.2	21 48.2	+ 1 53.0	-0.7092	0.5978	0.0699	-17	-90
69 G. Sagittarii	6.3	+1.01	- 4.3	-26 48.6	21 50.0	+ 1 54.6	+0.6400	0.5978	+0.0700	+58	- 6
86 B. Sagittarii	6.5	1.00	4.3	26 38.2	22 9.3	+ 2 13.2	+0.4895	0.5977	0.0709	+48	-15
126 B. Sagittarii	5.7	0.93	4.4	25 5.9	**28** 4 11.7	+ 8 0.6	-0.5750	0.5960	0.0892	- 8	-84
σ Sagittarii	2.1	0.90	3.8	26 24.2	8 9.2	+11 48.3	+1.1135	0.5946	0.1009	+64	+28
162 B. Sagittarii	6.4	0.87	4.1	24 59.5	9 21.2	-11 2.6	-0.1826	0.5941	0.1043	+14	-54
127 G. Sagittarii	6.4	+0.87	- 4.0	-25 3.7	10 8.6	-10 17.1	-0.0287	0.5938	+0.1066	+22	-44

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

FEBRUARY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1916.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, *H*	*Y*	*x′*	*y′*	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
172 B. Sagittarii	5.8	+0.86	− 4.0	−24 57.9	28 10 56.1	− 9 31.5	−0.0402	0.5935	+0.1089	+22	−45
189 B. Sagittarii	6.1	0.83	3.9	24 47.4	13 9.5	− 7 23.5	+0.0341	0.5925	0.1153	+26	−41
ψ Sagittarii	4.9	0.81	3.6	25 24.2	15 57.9	− 4 42.0	+0.9842	0.5912	0.1231	+65	+16
208 B. Sagittarii	6.1	0.80	3.9	24 19.5	15 59.0	− 4 41.0	−0.0971	0.5912	0.1232	+20	−49
χ Sagittarii	4.9	0.77	3.6	24 40.4	19 45.4	− 1 3.7	+0.7378	0.5892	0.1335	+65	− 1
49 Sagittarii	5.5	+0.76	− 3.7	−24 7.7	19 51.1	− 0 58.1	+0.2037	0.5892	+0.1338	+37	−31
53 Sagittarii	6.3	0.71	3.5	23 37.2	29 1 28.5	+ 4 25.8	+0.4877	0.5861	0.1486	+54	−16
274 B. Sagittarii	6.1	0.71	3.5	23 37.4	1 35.4	+ 4 32.5	+0.5075	0.5860	0.1488	+56	−15
329 B. Sagittarii	6.1	0.63	3.1	22 58.2	10 4.0	−11 18.8	+1.2032	0.5808	0.1697	+67	+34
336 B. Sagittarii	6.5	0.62	3.1	22 50.0	11 0.8	−10 24.4	+1.2271	0.5802	0.1719	+67	+37
σ Capricorni	5.5	+0.55	− 3.5	−19 22.9	17 24.3	− 4 15.5	−1.0897	0.5760	+0.1862	−30	−90
ο Capricorni	5.6	+0.51	− 3.4	−18 51.8	21 43.6	− 0 6.0	−0.7865	0.5730	+0.1953	− 9	−90

MARCH.

Name.	Mag.	Δα	Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle, *H*	*Y*	*x′*	*y′*	N.	S.
υ Capricorni	5.3	+0.48	− 3.2	−18 26.2	1 1 57.0	+ 3 57.8	−0.3729	0.5701	+0.2036	+14	−65
81 B. Capricorni	6.4	0.46	3.0	18 20.8	5 51.0	+ 7 43.2	+0.3465	0.5674	0.2109	+53	−24
19 Capricorni	5.7	0.44	2.8	18 14.6	8 9.6	+ 9 56.7	+0.7340	0.5657	0.2150	+72	− 3
94 B. Capricorni	5.7	0.42	3.1	16 21.4	9 24.0	+11 8.3	−0.8941	0.5649	0.2171	−12	−90
21 Capricorni	6.5	0.42	2.8	17 51.6	10 44.7	−11 33.8	+0.9106	0.5639	0.2194	+72	+ 8
θ Capricorni	4.2	+0.41	− 2.7	−17 34.1	12 55.2	− 9 28.1	+1.0989	0.5624	+0.2229	+72	+21
MERCURY	0.3	. . .	. . .	−16 54.9	15 17.5	− 7 11.0	+0.9775	0.5194	0.2215	+73	+11
				NEW	*MOON.*						
136 B. Piscium	6.5	+0.22	+ 3.5	+ 8 53.9	5 18 16.9	− 7 25.4	+0.1661	0.5251	+0.2497	+52	−32
75 Piscium	6.3	+0.27	+ 4.9	+12 30.5	6 6 41.7	+ 4 36.2	−0.5987	0.5259	+0.2373	+11	−74
η Piscium	3.7	0.35	6.1	14 54.9	18 49.6	− 7 38.8	−0.3564	0.5276	0.2223	+24	−57
101 Piscium	6.2	0.37	6.0	14 14.0	20 54.8	− 5 37.6	+0.8273	0.5281	0.2195	+90	+ 7
105 Piscium	6.1	0.38	6.6	15 58.9	22 47.3	− 3 48.7	−0.6201	0.5283	0.2168	+10	−71
3 Arietis	6.4	0.40	7.0	16 59.7	7 2 7.2	− 0 35.0	−0.9841	0.5290	0.2121	−12	−73
4 Arietis	5.8	+0.41	+ 6.9	+16 32.4	2 53.5	+ 0 9.9	−0.3367	0.5291	+0.2110	+25	−54
ι Arietis	5.1	0.44	7.3	17 24.6	7 17.9	+ 4 25.8	−0.3503	0.5301	0.2043	+24	−54
35 B. Arietis	6.4	0.47	7.5	17 51.1	10 20.8	+ 7 22.9	−0.2076	0.5307	0.1996	+32	−46
47 B. Arietis	6.5	0.49	7.6	17 37.9	12 17.3	+ 9 15.6	+0.4127	0.5312	0.1964	+63	−13
15 Arietis	5.9	0.50	8.0	19 6.4	13 38.2	+10 33.9	−0.9033	0.5315	0.1943	− 8	−71
θ Arietis	5.6	+0.54	+ 8.2	+19 30.9	17 12.7	− 9 58.5	−0.6592	0.5323	+0.1883	+ 7	−69
26 Arietis	6.2	0.60	8.4	19 29.1	23 8.6	− 4 14.0	+0.4592	0.5338	0.1780	+72	− 9
ν Arietis	5.4	0.64	9.1	21 36.1	8 2 59.0	− 0 31.2	−1.1508	0.5348	0.1710	−28	−68
μ Arietis	5.7	0.66	8.6	19 39.4	4 40.4	+ 1 7.0	+1.2337	0.5352	0.1679	+89	+44
ε Arietis (*mean*)	4.6	0.75	9.1	21 0.5	12 33.0	+ 8 44.1	+1.0412	0.5372	0.1529	+90	+29
64 Arietis	5.8	+0.90	+10.3	+24 25.8	9 0 8.6	− 4 3.4	−1.0377	0.5400	+0.1294	−20	−66
66 Arietis	6.1	0.93	9.6	22 31.1	2 4.6	− 2 11.2	+1.2912	0.5405	0.1253	+74	+58
7 Tauri	5.9	0.97	10.2	24 11.2	4 48.8	+ 0 27.5	−0.1920	0.5411	0.1195	+32	−36
11 Tauri	6.1	1.01	10.4	25 3.7	7 42.2	+ 3 15.1	−0.8114	0.5417	0.1133	− 4	−65
16 Tauri	5.4	1.04	10.1	24 1.7	9 33.8	+ 5 3.0	+0.5236	0.5421	0.1092	+79	+ 2
17 Tauri	3.8	+1.04	+10.0	+23 51.2	9 36.0	+ 5 5.0	+0.7197	0.5421	+0.1091	+90	+13
18 Tauri	5.6	1.04	10.2	24 34.8	9 43.2	+ 5 12.0	−0.0611	0.5421	0.1089	+39	−28
q Tauri	4.3	1.04	10.1	24 12.5	9 44.8	+ 5 13.5	+0.3482	0.5421	0.1088	+64	− 7
20 Tauri	4.1	1.04	10.1	24 6.5	10 1.8	+ 5 30.0	+0.4868	0.5422	0.1082	+75	0
21 Tauri	5.8	1.04	10.1	24 17.8	10 3.9	+ 5 32.1	+0.2863	0.5422	0.1081	+60	−10
22 Tauri	6.5	+1.05	+10.1	+24 16.2	10 7.8	+ 5 35.8	+0.3221	0.5422	+0.1080	+63	− 8
23 Tauri	4.3	1.05	9.9	23 41.4	10 15.9	+ 5 43.6	+0.9699	0.5422	0.1076	+90	+29
η Tauri	3.0	1.05	10.0	23 50.9	10 47.6	+ 6 14.2	+0.8529	0.5423	0.1065	+90	+21
27 Tauri	3.7	1.06	9.9	23 48.0	11 33.6	+ 6 58.7	+0.9877	0.5425	0.1048	+90	+31
28 Tauri	5.2	1.06	10.0	23 53.0	11 34.2	+ 6 59.3	+0.8973	0.5425	0.1048	+90	+24
14 H. Tauri	5.3	+1.08	+10.4	+25 19.8	12 3.8	+ 7 27.9	−0.6325	0.5426	+0.1037	+ 7	−61

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MARCH.

The Star's						At Conjunction in R. A.					Limiting Parallels.	
	Name.	Mag.	Red'ns from 1916.0. Δα	Red'ns from 1916.0. Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
			s	″	° ′	d h m	h m				°	°
p	Tauri	5.6	+1.22	+10.6	+26 15.9	**9** 21 23.4	− 7 31.4	−0.7896	0.5442	+0.0827	− 3	−64
χ	Tauri	5.3	1.30	10.1	25 26.1	**10** 2 43.7	− 2 22.1	+0.5313	0.5450	0.0705	+80	+ 7
38 B.	Aurigæ	6.5	1.60	9.8	27 34.9	21 40.0	− 8 4.5	−0.9203	0.5462	0.0259	−13	−62
47 B.	Aurigæ	6.0	1.64	9.8	27 55.7	23 57.9	− 5 51.4	−1.2495	0.5462	0.0203	−50	−62
354 B.	Tauri	6.4	1.72	9.4	27 52.5	**11** 5 2.0	− 0 57.6	−1.1200	0.5461	+0.0082	−30	−62
107 B.	Aurigæ	6.5	+1.82	+ 8.7	+27 36.6	11 46.8	+ 5 33.3	−0.8266	0.5456	−0.0078	− 6	−62
112 B.	Aurigæ	5.7	1.82	8.4	26 52.5	12 20.6	+ 6 6.0	−0.0180	0.5456	0.0092	+42	−16
125	Tauri	5.1	1.83	7.9	25 51.2	13 32.0	+ 7 14.9	+1.0992	0.5456	0.0120	+90	+47
136	Tauri	4.6	1.94	8.0	27 35.7	19 39.2	−10 50.4	−0.9458	0.5448	0.0265	−15	−62
139	Tauri	4.7	1.95	7.2	25 56.8	21 48.0	− 8 45.9	+0.8162	0.5445	0.0316	+90	+26
415 B.	Tauri	6.1	+1.99	+ 7.6	+27 34.3	23 8.4	− 7 28.3	−1.0255	0.5443	−0.0347	−21	−62
ε	Geminorum	3.2	2.23	4.6	25 13.0	**12** 18 49.9	+11 33.4	+0.4483	0.5402	0.0797	+72	+ 1
37	Geminorum	5.7	2.30	4.0	25 29.0	**13** 0 6.0	− 7 21.1	−0.2967	0.5387	0.0913	+26	−39
39	Geminorum	6.2	2.33	4.1	26 11.6	1 42.7	− 5 47.6	−1.2320	0.5383	0.0948	−42	−64
40	Geminorum	6.3	2.33	4.0	26 1.8	2 1.2	− 5 29.7	−1.0809	0.5382	0.0954	−25	−64
ω	Geminorum	5.2	+2.32	+ 3.2	+24 20.2	3 25.5	− 4 8.1	+0.6543	0.5378	−0.0985	+90	+10
48	Geminorum	5.8	2.37	2.6	24 16.3	8 6.9	+ 0 23.9	+0.2418	0.5364	0.1084	+58	−12
52	Geminorum	6.1	2.40	2.7	25 2.0	9 9.6	+ 1 24.5	−0.7137	0.5361	0.1105	+ 2	−65
58	Geminorum	6.0	2.41	1.5	23 6.5	13 19.5	+ 5 26.3	+0.9323	0.5347	0.1191	+90	+25
	B. D.+23° 1744	6.4	2.46	0.9	23 4.1	17 45.9	+ 9 44.0	+0.4275	0.5333	0.1280	+70	− 5
187 B.	Geminorum	6.3	+2.50	+ 0.4	+23 12.8	21 38.0	−10 31.3	−0.2440	0.5320	−0.1356	+29	−40
192 B.	Geminorum	6.3	2.50	+ 0.1	22 35.9	22 47.3	− 9 24.3	+0.2765	0.5316	0.1379	+59	−14
82	Geminorum	6.3	2.54	0.0	23 21.0	**14** 1 15.6	− 7 0.7	−0.8974	0.5308	0.1426	− 9	−67
μ	Cancri	5.5	2.60	− 1.8	21 49.6	10 33.3	+ 1 59.2	−0.6250	0.5277	0.1596	+ 8	−65
	NEPTUNE	7.7	. . .	. . .	19 51.8	13 24.0	+ 4 44.6	+1.0690	0.5274	0.1647	+90	+29
49 B.	Cancri	6.0	+2.64	− 2.9	+21 0.8	16 42.3	+ 7 56.6	−0.7463	0.5256	−0.1703	+ 2	−69
θ	Cancri	5.5	2.63	4.3	18 22.7	22 16.7	−10 39.4	+1.1652	0.5239	0.1795	+90	+35
ε	Cancri	6.3	2.69	4.6	19 50.5	**15** 2 38.4	− 6 25.9	−1.2338	0.5225	0.1864	−35	−70
δ	Cancri	4.2	2.68	5.2	18 27.7	4 45.8	− 4 22.5	−0.1253	0.5218	0.1896	+36	−40
X	Cancri (*var.*)	6.2	2.70	6.1	17 33.0	10 6.9	+ 0 48.9	−0.1658	0.5202	0.1976	+34	−43
81	Cancri	6.4	+2.71	− 7.7	+15 20.0	18 40.7	+ 9 7.1	+0.5039	0.5179	−0.2093	+74	−11
π	Cancri	5.6	2.72	8.0	15 17.3	20 8.6	+10 32.3	+0.2443	0.5176	0.2113	+57	−24
227 B.	Cancri	6.4	2.75	8.2	15 43.6	23 11.6	−10 30.3	−0.8808	0.5169	0.2151	− 6	−74
18	Leonis	5.8	2.75	10.6	12 11.7	**16** 12 4.1	+ 1 59.2	+0.0762	0.5143	0.2298	+47	−35
19	Leonis	6.4	2.75	10.7	11 57.3	12 36.4	+ 2 30.5	+0.2113	0.5143	0.2304	+55	−28
R	Leonis (*var.*)	5–10	+2.75	−10.8	+11 49.0	12 40.3	+ 2 34.3	+0.3457	0.5143	−0.2304	+63	−21
A	Leonis	4.6	2.77	12.2	10 24.4	23 10.1	−11 14.6	−0.6084	0.5130	0.2403	+10	−76
43	Leonis	6.3	2.75	13.5	6 58.0	**17** 7 0.0	− 3 38.7	+1.1727	0.5126	0.2466	+90	+26
48	Leonis	5.2	2.77	14.1	7 23.0	13 6.4	+ 2 17.0	−0.7916	0.5125	0.2507	+ 1	−83
35	Sextantis	6.1	2.76	14.7	5 11.1	17 32.4	+ 6 35.2	+0.4358	0.5126	0.2532	+68	−19
d	Leonis	5.0	+2.77	−15.6	+ 4 3.9	**18** 2 26.5	− 8 46.6	−0.6462	0.5134	−0.2573	+ 9	−83
p^4	Leonis	5.7	2.75	16.0	2 24.4	5 44.3	− 5 34.7	+0.2609	0.5139	0.2585	+57	−29
75	Leonis	5.4	2.77	16.4	2 28.1	11 3.5	− 0 24.9	−1.1817	0.5148	0.2599	−25	−88
76	Leonis	6.0	2.76	16.5	2 6.4	11 54.0	+ 0 24.1	−1.0177	0.5150	0.2601	−13	−88
359 B.	Leonis	6.3	2.75	16.7	+ 0 35.3	14 9.0	+ 2 35.1	0.0000	0.5154	0.2605	+43	−43
388 B.	Leonis	6.3	+2.74	−17.0	− 1 14.5	16 30.4	+ 4 52.2	+1.3169	0.5159	−0.2608	+88	+38
υ	Leonis	4.5	2.75	17.2	0 21.9	21 7.0	+ 9 20.7	−0.8119	0.5171	0.2612	0	−90
431 B.	Leonis	6.2	2.74	17.3	1 58.6	21 51.6	+10 3.8	+0.6900	0.5174	0.2612	+88	− 8
78 B.	Virginis	6.5	2.74	18.1	5 15.4	**19** 15 52.2	+ 3 31.6	−0.5568	0.5239	0.2580	+13	−77
q	Virginis	5.3	2.72	18.2	8 59.6	**20** 1 27.0	−11 11.6	+0.8857	0.5284	0.2534	+81	+ 5
χ	Virginis	4.8	+2.73	−18.4	− 7 32.3	4 6.4	− 8 37.2	−1.2980	0.5298	−0.2518	−38	−90
370 B.	Virginis	6.0	2.72	18.2	11 11.9	11 20.0	− 1 37.3	+0.6994	0.5338	0.2465	+79	− 6
75	Virginis	5.6	2.70	17.6	14 56.2	**21** 5 17.2	− 8 15.6	+0.2889	0.5453	0.2278	+53	−27
83	Virginis	5.6	2.69	17.3	15 45.7	10 32.8	− 3 10.8	−0.0413	0.5490	0.2208	+34	−45
85	Virginis	6.1	2.69	17.4	15 21.0	11 2.4	− 2 42.1	−0.5731	0.5494	0.2201	+ 7	−80
43 H.	*Virginis*	5.5	+2.66	−16.4	−17 48.8	**22** 0 10.6	+ 9 58.4	−0.8013	0.5590	−0.1992	− 9	−90

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MARCH.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1916.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, *H*	*Y*	*x′*	*y′*	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
231 G. Virginis	6.4	+2.66	-16.3	-18 12.0	22 0 53.4	+10 39.6	-0.5475	0.5596	-0.1980	+ 5	-79
236 G. Virginis	5.7	2.66	16.2	18 19.9	1 34.3	+11 19.2	-0.5470	0.5600	0.1968	+ 5	-79
9 G. Libræ	6.5	2.65	15.4	20 4.5	8 29.1	- 6 1.1	-0.0777	0.5652	0.1837	+27	-47
17 G. Libræ	6.4	2.64	15.0	20 49.5	13 15.0	- 1 25.6	-0.1648	0.5687	0.1740	+22	-52
18 G. Libræ	6.1	2.64	14.9	20 58.6	13 41.1	- 1 0.6	-0.0841	0.5690	0.1731	+26	-47
43 B. Libræ	5.7	+2.64	-15.0	-21 2.5	17 53.7	+ 3 2.6	-0.7274	0.5720	-0.1640	- 9	-90
47 G. Libræ	6.1	2.61	14.1	21 42.6	21 37.4	+ 6 38.0	-0.6419	0.5747	0.1556	- 5	-90
64 G. Libræ	5.8	2.58	13.6	22 5.6	23 1 40.1	+10 31.4	-0.8606	0.5774	0.1460	-18	-90
153 B. Libræ	6.3	2.57	12.5	24 12.5	8 23.2	- 7 1.1	+0.3684	0.5818	0.1293	+46	-22
169 B. Libræ	6.0	2.54	12.7	22 52.0	10 15.3	- 5 13.3	-1.2336	0.5830	0.1245	-51	-85
177 B. Libræ	6.2	+2.53	-12.6	-22 52.8	10 52.4	- 4 37.7	-1.2971	0.5833	-0.1229	-62	-69
42 Libræ	5.0	2.54	12.4	23 33.0	11 13.9	- 4 17.1	-0.6597	0.5835	0.1220	- 9	-90
b Scorpii	4.7	2.54	11.4	25 30.0	15 25.9	- 0 15.0	+0.8352	0.5859	0.1108	+65	+ 6
A Scorpii	4.6	2.52	11.4	25 4.8	16 28.3	+ 0 45.0	+0.2945	0.5865	0.1080	+39	-26
31 B. Scorpii	5.4	2.51	11.6	24 17.2	16 35.6	+ 0 52.0	-0.5249	0.5866	0.1076	- 3	-79
32 B. Scorpii	5.3	+2.50	-11.8	-23 43.9	16 36.8	+ 0 53.2	-1.0916	0.5866	-0.1076	-39	-90
3 Scorpii	5.9	2.52	11.4	24 59.9	16 53.0	+ 1 8.7	+0.1675	0.5867	0.1068	+32	-33
4 Scorpii	5.7	2.53	11.0	26 1.3	17 12.1	+ 1 27.0	+1.1739	0.5869	0.1060	+64	+34
40 B. Scorpii	5.4	2.50	11.3	24 35.6	18 25.5	+ 2 37.5	-0.4063	0.5876	0.1026	+ 2	-69
π Scorpii	3.0	2.52	11.0	25 52.6	18 30.8	+ 2 42.6	+0.8888	0.5876	0.1024	+64	+10
48 B. Scorpii	4.9	+2.50	-10.8	-25 38.1	20 16.4	+ 4 24.0	+0.4677	0.5885	-0.0975	+49	-16
50 B. Scorpii	6.4	2.48	11.2	24 29.9	20 30.5	+ 4 37.6	-0.7098	0.5886	0.0968	-14	-90
24 G. Scorpii	6.2	2.47	11.0	24 14.5	22 3.0	+ 6 6.3	-1.1171	0.5893	0.0925	-42	-90
65 B. Scorpii	5.5	2.50	10.4	26 6.3	22 7.3	+ 6 10.5	+0.7695	0.5893	0.0923	+64	+ 2
85 B. Scorpii	6.0	2.46	10.4	25 16.0	24 0 45.6	+ 8 42.4	-0.3149	0.5906	0.0848	+ 5	-62
σ Scorpii	3.1	+2.44	-10.1	-25 23.7	3 11.5	+11 2.4	-0.3827	0.5917	-0.0777	+ 1	-67
α Scorpii	1.2	2.42	9.4	26 15.0	6 20.5	- 9 56.3	+0.2537	0.5929	0.0685	+34	-28
22 Scorpii	4.8	2.40	9.8	24 56.0	6 40.1	- 9 37.4	-1.1033	0.5930	0.0676	-43	-90
116 B. Scorpii	6.2	2.42	9.3	26 21.5	7 6.0	- 9 12.6	+0.3133	0.5931	0.0663	+37	-25
134 B. Scorpii	6.4	2.39	8.4	27 18.1	12 1.4	- 4 29.2	+0.9798	0.5947	0.0516	+63	+17
118 B. Ophiuchi	6.2	+2.29	- 7.6	-26 24.2	20 37.7	+ 3 45.9	-0.2635	0.5966	-0.0254	+ 3	-59
95 G. Ophiuchi	6.1	2.28	7.0	27 39.7	22 42.4	+ 5 45.4	+0.9660	0.5969	0.0189	+62	+16
36 Ophi. (*1st star*)	5.4	2.24	7.5	26 29.0	23 51.1	+ 6 51.3	-0.2479	0.5970	0.0154	+ 2	-58
136 G. Ophiuchi	6.3	2.19	6.9	25 52.3	25 4 13.5	+11 2.8	-0.9046	0.5973	-0.0019	-35	-90
151 G. Ophiuchi	6.0	2.18	6.5	26 12.5	6 2.6	-11 12.6	-0.5622	0.5972	+0.0038	-15	-83
163 G. Ophiuchi	6.3	+2.15	- 5.4	-27 50.8	10 23.5	- 7 2.4	+1.1428	0.5970	+0.0172	+62	+33
X Sagittarii (*var.*)	4.4	2.13	5.2	27 48.1	12 0.5	- 5 29.4	+1.1294	0.5968	0.0223	+62	+31
4 G. Sagittarii	6.2	2.12	5.5	26 56.9	12 21.8	- 5 9.0	+0.2729	0.5968	0.0234	+31	-27
66 B. Sagittarii	4.7	1.98	4.0	27 4.5	23 36.9	+ 5 38.4	+0.8581	0.5945	0.0576	+63	+ 8
67 B. Sagittarii	6.4	1.95	4.5	25 38.3	23 52.9	+ 5 53.7	-0.5811	0.5944	0.0584	-11	-85
70 B. Sagittarii	6.4	+1.93	- 4.6	-24 57.3	26 0 58.5	+ 6 56.7	-1.2073	0.5941	+0.0617	-53	-86
68 G. Sagittarii	6.2	1.93	3.7	26 41.2	3 19.6	+ 9 12.0	+0.6993	0.5933	0.0687	+62	- 2
λ Sagittarii	2.9	1.90	4.1	25 28.2	3 26.4	+ 9 18.6	-0.5244	0.5933	0.0690	- 7	-79
69 G. Sagittarii	6.3	1.93	3.6	26 48.6	3 28.2	+ 9 20.3	+0.8335	0.5933	0.0691	+63	+ 6
86 B. Sagittarii	6.5	1.92	3.6	26 38.2	3 47.8	+ 9 39.1	+0.6821	0.5931	0.0701	+61	- 3
126 B. Sagittarii	5.7	+1.82	- 3.4	-25 5.8	9 56.4	- 8 27.3	-0.3917	0.5907	+0.0880	+ 2	-68
162 B. Sagittarii	6.4	1.75	2.8	24 59.4	15 11.7	- 3 24.6	+0.0016	0.5882	0.1028	+23	-42
127 G. Sagittarii	6.4	1.74	2.7	25 3.6	16 0.1	- 2 38.2	+0.1563	0.5879	0.1050	+32	-34
172 B. Sagittarii	5.8	1.73	2.7	24 57.9	16 48.5	- 1 51.7	+0.1444	0.5874	0.1072	+31	-34
189 B. Sagittarii	6.1	1.70	2.5	24 47.4	19 4.7	+ 0 19.1	+0.2184	0.5863	0.1134	+36	-30
191 B. Sagittarii	6.5	+1.67	- 3.0	-23 19.5	19 17.8	+ 0 31.7	-1.2415	0.5862	+0.1140	-53	-83
ψ Sagittarii	4.9	1.67	1.9	25 24.2	21 56.7	+ 3 4.3	+1.1758	0.5847	0.1211	+65	+34
208 B. Sagittarii	6.1	1.66	2.3	24 19.4	21 57.8	+ 3 5.3	+0.0847	0.5847	0.1212	+29	-38
χ Sagittarii	4.9	1.61	1.8	24 40.4	27 1 49.2	+ 6 47.7	+0.9255	0.5824	0.1312	+65	+12
49 Sagittarii	5.5	1.60	1.9	24 7.7	1 55.2	+ 6 53.3	+0.3862	0.5824	0.1315	+47	-21
53 Sagittarii	6.3	+1.52	- 1.5	-23 37.2	7 40.4	-11 34.7	+0.6697	0.5788	+0.1459	+65	- 5

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MARCH.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1916.0. Δα	Red'ns from 1916.0. Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x′	y′	N.	S.
		s	″	° ′	d h m	h m				°	°
274 B. Sagittarii	6.1	+1.52	−1.5	−23 37.4	**27** 7 47.5	−11 28.0	+0.6895	0.5788	+0.1462	+66	− 4
σ Capricorni	5.5	1.27	1.2	19 22.9	**28** 0 0.8	+ 4 8.5	−0.9385	0.5679	0.1825	−19	−90
π Capricorni	5.2	1.22	1.1	18 29.3	3 22.0	+ 7 22.3	−1.2233	0.5656	0.1892	−41	−90
o Capricorni	5.6	1.22	0.9	18 51.7	4 27.2	+ 8 25.1	−0.6365	0.5648	0.1913	0	−87
υ Capricorni	5.3	1.16	0.6	18 26.1	8 47.6	−11 24.0	−0.2226	0.5619	0.1994	+22	−55
81 B. Capricorni	6.4	+1.12	−0.3	−18 20.8	12 48.0	− 7 32.1	+0.5008	0.5592	+0.2065	+62	−16
19 Capricorni	5.7	1.09	0.1	18 14.5	15 10.6	− 5 14.7	+0.8902	0.5576	0.2104	+72	+ 7
94 B. Capricorni	5.7	1.06	−0.6	16 21.3	16 27.1	− 4 0.9	−0.7595	0.5567	0.2125	− 5	−90
21 Capricorni	6.5	1.06	0.0	17 51.5	17 50.0	− 2 41.0	+1.0658	0.5558	0.2148	+72	+19
θ Capricorni	4.2	1.04	+0.1	17 34.0	20 4.2	− 0 31.4	+1.2537	0.5543	0.2182	+72	+36
29 Capricorni	5.5	+0.97	−0.2	−15 31.3	**29** 0 26.5	+ 3 41.7	+0.1389	0.5515	+0.2246	+44	−35
18 Aquarii	5.5	0.91	−0.4	13 14.4	4 14.7	+ 7 22.0	−1.3228	0.5491	0.2298	−47	−82
λ Capricorni	5.5	0.81	0.0	11 45.2	14 25.8	− 6 47.6	−0.4366	0.5431	0.2418	+16	−69
151 B. Capricorni	6.1	0.81	+0.4	13 6.9	15 52.3	− 5 24.1	+1.3034	0.5423	0.2433	+77	+39
96 B. Aquarii	6.5	0.77	0.0	10 42.5	17 42.1	− 3 37.9	−0.7092	0.5413	0.2451	+ 2	−90
θ Aquarii	4.3	+0.67	+0.2	− 8 12.1	**30** 4 35.7	+ 6 54.3	−0.5534	0.5360	+0.2542	+13	−77
150 B. Aquarii	6.0	0.68	0.5	9 27.5	4 36.8	+ 6 55.3	+0.7398	0.5360	0.2542	+81	− 4
ρ Aquarii	5.3	0.66	0.4	8 14.6	6 11.6	+ 8 27.0	−0.1038	0.5352	0.2553	+35	−48
170 B. Aquarii	6.0	0.64	0.4	7 37.2	7 47.0	+ 9 59.4	−0.3370	0.5346	0.2563	+24	−62
186 B. Aquarii	6.1	0.62	0.5	6 59.1	11 29.1	−10 25.7	−0.0359	0.5331	0.2585	+40	−44
252 B. Aquarii	5.8	+0.53	+1.0	− 5 26.1	23 0.6	+ 0 43.8	+1.3822	0.5291	+0.2631	+78	+48
6 G. Piscium	6.2	+0.51	+0.7	− 2 50.7	**31** 0 31.2	+ 2 11.5	−0.8883	0.5287	+0.2635	− 5	−90
				NEW	*MOON.*						
					APRIL.						
26 Arietis	6.2	+0.40	+6.7	+19 29.1	**4** 7 58.6	+ 6 23.9	+0.2938	0.5379	+0.1777	+60	−17
ν Arietis	5.4	0.42	7.2	21 36.0	11 47.0	+10 4.7	−1.3189	0.5390	0.1708	−52	−68
μ Arietis	5.7	0.44	6.9	19 39.4	13 27.6	+11 42.1	+1.0580	0.5395	0.1677	+90	+29
ε Arietis (*mean*)	4.6	+0.50	+7.4	+21 0.4	21 15.7	− 4 45.3	+0.8543	0.5417	+0.1527	+90	+17
64 Arietis	5.8	0.59	8.3	24 25.8	**5** 8 44.5	+ 6 20.3	−1.2341	0.5446	0.1292	−41	−66
66 Arietis	6.1	0.61	7.9	22 31.0	10 39.4	+ 8 11.4	+1.0856	0.5450	0.1251	+90	+35
7 Tauri	5.9	0.64	8.3	24 11.2	13 21.9	+10 48.4	−0.3963	0.5456	0.1192	+20	−47
11 Tauri	6.1	0.67	8.5	25 3.7	16 13.6	−10 25.7	−1.0171	0.5462	0.1130	−19	−65
16 Tauri	5.4	+0.69	+8.3	+24 1.7	18 4.2	− 8 38.8	+0.3116	0.5466	+0.1089	+62	− 9
17 Tauri	3.8	0.69	8.3	23 51.1	18 6.2	− 8 36.9	+0.5071	0.5466	0.1088	+77	+ 2
18 Tauri	5.6	0.69	8.4	24 34.7	18 13.4	− 8 30.0	−0.2714	0.5466	0.1086	+27	−39
q Tauri	4.3	0.69	8.4	24 12.4	18 15.0	− 8 28.4	+0.1366	0.5466	0.1085	+51	−17
20 Tauri	4.1	0.69	8.3	24 6.5	18 31.9	− 8 12.1	+0.2745	0.5466	0.1079	+59	−10
21 Tauri	5.8	+0.69	+8.4	+24 17.7	18 33.9	− 8 10.2	+0.0744	0.5467	+0.1078	+47	−20
22 Tauri	6.5	0.69	8.4	24 16.1	18 37.8	− 8 6.5	+0.1101	0.5467	0.1077	+49	−19
23 Tauri	4.3	0.70	8.2	23 41.4	18 45.8	− 7 58.6	+0.7557	0.5467	0.1074	+90	+15
η Tauri	3.0	0.70	8.3	23 50.9	19 17.2	− 7 28.3	+0.6386	0.5468	0.1062	+90	+ 9
27 Tauri	3.7	0.71	8.2	23 48.0	20 2.8	− 6 44.3	+0.7720	0.5469	0.1045	+90	+17
28 Tauri	5.2	+0.71	+8.3	+23 53.0	20 3.4	− 6 43.8	+0.6821	0.5469	+0.1045	+90	+12
14 H. Tauri	5.3	0.72	8.6	25 19.8	20 32.6	− 6 15.5	−0.8436	0.5470	0.1034	− 6	−65
p Tauri	5.6	0.82	8.8	26 15.9	**6** 5 47.0	+ 2 40.1	−1.0097	0.5484	0.0823	−19	−64
χ Tauri	5.3	0.89	8.6	25 26.1	11 4.5	+ 7 46.6	+0.3021	0.5490	0.0700	+61	− 5
38 B. Aurigæ	6.5	1.14	8.6	27 34.9	**7** 5 52.4	+ 1 55.8	−1.1605	0.5492	+0.0253	−35	−62
107 B. Aurigæ	6.5	+1.34	+8.0	+27 36.6	19 55.3	− 8 30.4	−1.0762	0.5477	−0.0083	−26	−62
112 B. Aurigæ	5.7	1.34	7.7	26 52.5	20 29.0	− 7 57.8	−0.2692	0.5477	0.0097	+27	−30
125 Tauri	5.1	1.34	7.3	25 51.2	21 40.1	− 6 49.2	+0.8457	0.5474	0.0125	+90	+30
136 Tauri	4.6	1.45	7.5	27 35.7	**8** 3 46.5	− 0 55.4	−1.1993	0.5463	0.0269	−40	−62
139 Tauri	4.7	1.46	6.8	25 56.8	5 55.1	+ 1 8.9	+0.5598	0.5458	0.0320	+82	+12
52 B. Geminorum	6.5	+1.69	+4.8	+24 39.8	23 58.9	− 5 23.9	+1.0279	0.5408	−0.0731	+90	+36

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

APRIL.

The Star's						At Conjunction in R. A.						Limiting Parallels.	
Name.		Mag.	Red'ns from 1916.0.		Apparent Declination.	Greenwich Mean Time.		Hour Angle, H	Y	x′	y′	N.	S.
			Δα	Δδ									
			s	″	° ′	d	h m	h m				°	°
ε	Geminorum	3.2	+1.74	+ 4.8	+25 13.0	9	2 58.0	− 2 30.7	+0.1871	0.5398	−0.0796	+54	−12
37	Geminorum	5.7	1.81	4.4	25 29.0		8 15.2	+ 2 36.0	−0.5588	0.5380	0.0910	+11	−55
ω	Geminorum	5.2	1.84	3.6	24 20.2		11 35.6	+ 5 49.8	+0.3928	0.5368	0.0981	+68	− 3
48	Geminorum	5.8	1.90	3.1	24 16.3		16 18.5	+10 23.4	−0.0198	0.5351	0.1078	+41	−26
52	Geminorum	6.1	1.92	3.2	25 2.0		17 21.5	+11 24.4	−0.9764	0.5346	0.1100	−16	−65
58	Geminorum	6.0	+1.94	+ 2.1	+23 6.5		21 33.0	− 8 32.4	+0.6723	0.5330	−0.1184	+90	+ 9
	B. D.+23° 1744	6.4	2.00	1.6	23 4.1	10	2 1.2	− 4 12.8	+0.1675	0.5313	0.1272	+52	−18
187 B.	Geminorum	6.3	2.05	1.2	23 12.9		5 55.1	− 0 26.4	−0.5043	0.5298	0.1346	+15	−56
192 B.	Geminorum	6.3	2.05	0.9	22 35.9		7 4.9	+ 0 41.2	+0.0175	0.5294	0.1368	+43	−27
82	Geminorum	6.3	2.09	+ 0.9	23 21.0		9 34.5	+ 3 6.0	−1.1581	0.5284	0.1414	−30	−67
μ	Cancri	5.5	+2.17	− 0.8	+21 49.6		18 57.2	−11 49.1	−0.8814	0.5248	−0.1581	− 8	−68
	Neptune	7.7	. . .	. . .	19 54.7		21 26.4	− 9 24.4	+0.8269	0.5239	0.1623	+90	+13
49 B.	Cancri	6.0	2.23	1.8	21 0.8	11	1 9.8	− 5 47.9	−0.9997	0.5225	0.1685	−15	−69
θ	Cancri	5.5	2.24	3.4	18 22.7		6 47.8	− 0 20.5	+0.9209	0.5206	0.1775	+90	+17
δ	Cancri	4.2	2.31	4.1	18 27.8		13 20.9	+ 6 0.6	−0.3682	0.5184	0.1874	+23	−54
X	Cancri (*var.*)	6.2	+2.35	− 5.0	+17 33.0		18 45.6	+11 15.5	−0.4039	0.5168	−0.1951	+21	−57
o^2	Cancri	5.7	2.33	5.7	15 54.2		19 53.7	−11 38.4	+1.1747	0.5164	0.1967	+90	+33
81	Cancri	6.4	2.38	6.7	15 20.0	12	3 25.0	− 4 20.7	+0.2768	0.5144	0.2066	+58	−22
π	Cancri	5.6	2.40	6.9	15 17.3		4 53.8	− 2 54.6	+0.0182	0.5141	0.2085	+44	−35
227 B.	Cancri	6.4	2.44	7.1	15 43.6		7 58.9	+ 0 4.9	−1.1067	0.5134	0.2123	−21	−74
18	Leonis	5.8	+2.49	− 9.7	+12 11.7		20 59.2	−11 17.9	−0.1291	0.5112	−0.2268	+36	−46
19	Leonis	6.4	2.49	9.8	11 57.3		21 31.9	−10 46.2	+0.0072	0.5111	0.2273	+43	−38
R	Leonis (*var.*)	5–10	2.49	9.8	11 49.0		21 35.7	−10 42.5	+0.1420	0.5111	0.2274	+50	−31
A	Leonis	4.6	2.55	11.4	10 24.4	13	8 11.1	− 0 25.7	−0.7970	0.5102	0.2373	0	−80
43	Leonis	6.3	2.56	13.1	6 58.0		16 4.5	+ 7 13.8	+1.0015	0.5102	0.2435	+90	+14
48	Leonis	5.2	+2.61	−13.6	+ 7 23.0		22 13.0	−10 48.5	−0.9533	0.5105	−0.2477	− 9	−83
35	Sextantis	6.1	2.62	14.5	5 11.1	14	2 40.2	− 6 29.0	+0.2842	0.5109	0.2503	+58	−27
d	Leonis	5.0	2.66	15.5	4 3.9		11 36.0	+ 2 10.9	−0.7785	0.5124	0.2546	+ 2	−86
p^4	Leonis	5.7	2.66	16.2	2 24.4		14 54.2	+ 5 23.2	+0.1355	0.5130	0.2558	+50	−35
p^5	Leonis	5.3	2.67	16.8	0 23.0		18 25.4	+ 8 48.2	+1.3728	0.5140	0.2570	+81	+46
75	Leonis	5.4	+2.70	−16.6	+ 2 28.1		20 13.5	+10 33.1	−1.2932	0.5144	−0.2575	−35	−88
76	Leonis	6.0	2.70	16.6	2 6.4		21 3.9	+11 22.0	−1.1274	0.5147	0.2577	−21	−88
359 B.	Leonis	6.3	2.70	17.1	+ 0 35.3		23 18.8	−10 27.1	−0.1056	0.5153	0.2581	+37	−48
388 B.	Leonis	6.3	2.70	17.6	− 1 14.5	15	1 39.9	− 8 10.2	+1.2147	0.5161	0.2585	+89	+28
υ	Leonis	4.5	2.74	17.7	0 21.9		6 15.9	− 3 42.6	−0.8987	0.5177	0.2590	− 6	−90
431 B.	Leonis	6.2	+2.73	−18.0	− 1 58.6		7 0.3	− 2 59.6	+0.6015	0.5180	−0.2591	+81	−11
78 B.	Virginis	6.5	2.82	19.3	5 15.4	16	0 53.9	− 9 38.8	−0.5958	0.5263	0.2566	+11	−80
q	Virginis	5.3	2.86	20.0	8 59.7		10 22.4	− 0 28.2	+0.8636	0.5318	0.2525	+81	+ 4
χ	Virginis	4.8	2.87	19.9	7 32.3		12 59.8	+ 2 4.1	−1.3000	0.5335	0.2509	−39	−89
370 B.	Virginis	6.0	2.91	20.2	11 11.9		20 7.3	+ 8 57.8	+0.7029	0.5383	0.2459	+79	− 5
75	Virginis	5.6	+3.00	−20.0	−14 56.2	17	13 45.2	+ 2 0.2	+0.3393	0.5516	−0.2279	+55	−24
83	Virginis	5.6	3.03	19.8	15 45.8		18 54.2	+ 6 58.4	+0.0247	0.5558	0.2210	+37	−41
85	Virginis	6.1	3.02	19.8	15 21.1		19 23.2	+ 7 26.4	−0.5006	0.5562	0.2203	+10	−74
43 H.	Virginis	5.5	3.08	19.0	17 48.9	18	8 13.3	− 4 11.1	−0.6959	0.5669	0.1997	− 3	−90
231 G.	Virginis	6.4	3.09	18.9	18 12.0		8 55.1	− 3 30.8	−0.4433	0.5675	0.1984	+10	−70
236 G.	Virginis	5.7	+3.09	−18.8	−18 19.9		9 35.0	− 2 52.3	−0.4413	0.5681	−0.1972	+10	−70
9 G.	Libræ	6.5	3.13	18.2	20 4.6		16 19.4	+ 3 37.0	+0.0378	0.5736	0.1842	+33	−40
17 G.	Libræ	6.4	3.14	17.7	20 49.5		20 58.1	+ 8 5.1	−0.0386	0.5774	0.1744	+28	−45
18 G.	Libræ	6.1	3.15	17.6	20 58.7		21 23.4	+ 8 29.5	+0.0420	0.5777	0.1735	+32	−40
43 B.	Libræ	5.7	3.18	17.7	21 2.6	19	1 29.5	−11 33.9	−0.5853	0.5810	0.1644	− 1	−83
47 G.	Libræ	6.1	+3.17	−16.7	−21 42.6		5 7.3	− 8 4.6	−0.4935	0.5837	−0.1559	+ 3	−75
64 G.	Libræ	5.8	3.17	16.2	22 5.6		9 3.5	− 4 17.6	−0.7019	0.5866	0.1463	− 9	−90
153 B.	Libræ	6.3	3.21	15.0	24 12.5		15 35.8	+ 1 59.2	+0.5240	0.5912	0.1294	+55	−13
169 B.	Libræ	6.0	3.18	14.9	22 52.1		17 25.0	+ 3 43.9	−1.0551	0.5923	0.1246	−34	−90
177 B.	Libræ	6.2	3.18	14.8	22 52.8		18 1.0	+ 4 18.5	−1.1167	0.5927	0.1229	−39	−90
42	Libræ	5.0	+3.19	−14.7	−23 33.0		18 22.0	+ 4 38.6	−0.4866	0.5929	−0.1220	0	−75

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

APRIL.

The Star's					At Conjunction in R. A.						Limiting Parallels.	
Name.	Mag.	Red'ns from 1916.0.		Apparent Declination.	Greenwich Mean Time.		Hour Angle, H	Y	x'	y'	N.	S.
		Δα	Δδ									
		s	″	° ′	d	h m	h m				°	°
b Scorpii	4.7	+3.22	−13.7	−25 30.0	**19**	22 27.2	+ 8 34.0	+0.9969	0.5953	−0.1107	+64	+18
A Scorpii	4.6	3.21	13.6	25 4.8		23 28.0	+ 9 32.3	+0.4644	0.5959	0.1079	+50	−16
31 B. Scorpii	5.4	3.20	13.8	24 17.3		23 35.2	+ 9 39.2	−0.3448	0.5960	0.1075	+ 6	−64
32 B. Scorpii	5.3	3.19	13.9	23 43.9		23 36.3	+ 9 40.2	−0.9044	0.5960	0.1075	−25	−90
3 Scorpii	5.9	3.21	13.6	25 0.0		23 52.0	+ 9 55.2	+0.3397	0.5961	0.1067	+42	−23
40 B. Scorpii	5.4	+3.20	−13.4	−24 35.6	**20**	1 22.1	+11 21.7	−0.2247	0.5970	−0.1024	+11	−56
π Scorpii	3.0	3.22	13.2	25 52.6		1 27.3	+11 26.7	+1.0546	0.5970	0.1022	+64	+23
48 B. Scorpii	4.9	3.21	13.0	25 38.1		3 10.1	−10 54.7	+0.6414	0.5978	0.0972	+60	− 6
50 B. Scorpii	6.4	3.19	13.2	24 29.9		3 23.8	−10 41.5	−0.5212	0.5979	0.0966	− 4	−78
24 G. Scorpii	6.2	3.18	13.0	24 14.5		4 53.9	− 9 15.2	−0.9211	0.5987	0.0922	−28	−90
65 B. Scorpii	5.5	+3.22	−12.6	−26 6.3		4 58.1	− 9 11.2	+0.9426	0.5987	−0.0920	+64	+13
41 G. Scorpii	6.3	3.17	12.6	24 12.7		7 7.5	− 7 7.1	−1.1492	0.5998	0.0856	−46	−90
85 B. Scorpii	6.0	3.19	12.3	25 16.1		7 32.3	− 6 43.4	−0.1247	0.5999	0.0844	+15	−50
σ Scorpii	3.1	3.19	11.9	25 23.7		9 54.4	− 4 27.1	−0.1882	0.6009	0.0773	+11	−54
α Scorpii	1.2	3.19	11.2	26 15.0		12 58.7	− 1 30.5	+0.4452	0.6020	0.0680	+45	−17
22 Scorpii	4.8	+3.16	−11.4	−24 56.1		13 17.7	− 1 12.3	−0.8952	0.6021	−0.0670	−29	−90
116 B. Scorpii	6.2	3.19	11.0	26 21.5		13 42.9	− 0 48.1	+0.5052	0.6022	0.0657	+49	−14
134 B. Scorpii	6.4	3.19	9.9	27 18.1		18 31.1	+ 3 48.0	+1.1707	0.6035	0.0509	+63	+36
118 B. Ophiuchi	6.2	3.12	8.6	26 24.2	**21**	2 55.2	+11 50.9	−0.0473	0.6049	0.0244	+14	−45
95 G. Ophiuchi	6.1	3.13	7.9	27 39.7		4 57.1	−10 12.4	+1.1713	0.6050	0.0179	+62	+36
36 Ophi. (*1st star*)	5.4	+3.08	− 8.4	−26 29.0		6 4.3	− 9 8.0	−0.0281	0.6050	−0.0144	+14	−44
136 G. Ophiuchi	6.3	3.05	7.4	25 52.3		10 21.0	− 5 2.2	−0.6731	0.6049	−0.0007	−21	−90
151 G. Ophiuchi	6.0	3.04	6.9	26 12.5		12 7.9	− 3 19.8	−0.3323	0.6047	+0.0049	− 3	−63
4 G. Sagittarii	6.2	3.00	5.6	26 56.9		18 19.7	+ 2 36.3	+0.5011	0.6037	0.0246	+45	−14
66 B. Sagittarii	4.7	2.89	3.4	27 4.5	**22**	5 23.2	−10 47.9	+1.0925	0.6002	0.0589	+63	+27
67 B. Sagittarii	6.4	+2.86	− 3.8	−25 38.3		5 39.0	−10 32.9	−0.3348	0.6000	+0.0597	+ 2	−63
70 B. Sagittarii	6.4	2.83	3.8	24 57.3		6 43.5	− 9 31.0	−0.9553	0.5996	0.0630	−33	−90
68 G. Sagittarii	6.2	2.84	2.8	26 41.2		9 2.6	− 7 17.6	+0.9384	0.5985	0.0700	+63	+14
λ Sagittarii	2.9	2.81	3.2	25 28.2		9 9.2	− 7 11.2	−0.2760	0.5985	0.0703	+ 6	−59
69 G. Sagittarii	6.3	2.84	2.8	26 48.5		9 11.0	− 7 9.6	+1.0718	0.5984	0.0704	+63	+25
86 B. Sagittarii	6.5	+2.83	− 2.8	−26 38.2		9 30.4	− 6 51.0	+0.9217	0.5983	+0.0713	+63	+13
126 B. Sagittarii	5.7	2.73	2.2	25 5.8		15 34.2	− 1 2.1	−0.1398	0.5951	0.0891	+15	−51
162 B. Sagittarii	6.4	2.66	1.3	24 59.4		20 46.0	+ 3 57.0	+0.2543	0.5920	0.1038	+37	−28
127 G. Sagittarii	6.4	2.65	1.1	25 3.6		21 34.0	+ 4 43.0	+0.4087	0.5915	0.1060	+46	−19
172 B. Sagittarii	5.8	2.64	1.0	24 57.8		22 21.9	+ 5 29.0	+0.3974	0.5910	0.1082	+46	−20
189 B. Sagittarii	6.1	+2.61	− 0.6	−24 47.4	**23**	0 36.8	+ 7 38.5	+0.4723	0.5895	+0.1144	+51	−16
191 B. Sagittarii	6.5	2.58	1.1	23 19.4		0 49.8	+ 7 51.0	−0.9800	0.5893	0.1149	−30	−90
208 B. Sagittarii	6.1	2.56	0.3	24 19.4		3 28.6	+10 23.5	+0.3407	0.5875	0.1220	+43	−23
222 B. Sagittarii	5.5	2.50	− 0.6	22 33.6		5 30.3	−11 39.6	−1.1852	0.5861	0.1272	−45	−90
χ Sagittarii	4.9	2.52	+ 0.4	24 40.4		7 18.4	− 9 55.8	+1.1799	0.5848	0.1319	+65	+34
49 Sagittarii	5.5	+2.50	+ 0.3	−24 7.7		7 24.3	− 9 50.2	+0.6429	0.5847	+0.1321	+63	− 6
53 Sagittarii	6.3	2.42	1.0	23 37.2		13 7.8	− 4 20.0	+0.9279	0.5804	0.1462	+66	+12
274 B. Sagittarii	6.1	2.42	1.0	23 37.3		13 14.9	− 4 13.2	+0.9478	0.5803	0.1465	+66	+13
σ Capricorni	5.5	2.12	2.0	19 22.9	**24**	5 27.3	+11 22.3	−0.6757	0.5675	0.1819	− 4	−90
π Capricorni	5.2	2.06	2.1	18 29.2		8 48.9	− 9 23.5	−0.9614	0.5648	0.1884	−20	−90
ρ Capricorni	5.0	+2.05	+ 2.0	−18 5.5		9 28.6	− 8 45.2	−1.2386	0.5642	+0.1896	−43	−90
o Capricorni	5.6	2.05	2.4	18 51.7		9 54.4	− 8 20.4	−0.3748	0.5639	0.1904	+13	−65
υ Capricorni	5.3	1.99	2.8	18 26.1		14 15.9	− 4 8.4	+0.0380	0.5604	0.1982	+35	−40
81 B. Capricorni	6.4	1.94	3.3	18 20.7		18 17.8	− 0 15.1	+0.7612	0.5572	0.2050	+72	− 1
19 Capricorni	5.7	1.90	3.5	18 14.5		20 41.3	+ 2 3.3	+1.1506	0.5554	0.2089	+72	+26
94 B. Capricorni	5.7	+1.86	+ 3.0	−16 21.3		21 58.4	+ 3 17.7	−0.5032	0.5544	+0.2108	+ 9	−74
21 Capricorni	6.5	1.86	3.7	17 51.5		23 22.0	+ 4 38.3	+1.3257	0.5533	0.2130	+72	+47
29 Capricorni	5.5	1.75	3.6	15 31.2	**25**	6 2.1	+11 4.7	+0.3925	0.5484	0.2224	+58	−22
18 Aquarii	5.5	1.67	3.3	13 14.3		9 52.6	− 9 12.7	−1.0774	0.5457	0.2273	−23	−90
λ Capricorni	5.5	1.53	3.8	11 45.2		20 11.3	+ 0 45.3	−0.1980	0.5390	0.2386	+28	−53
96 B. Aquarii	6.5	+1.48	+ 3.8	−10 42.4		23 30.4	+ 3 57.9	−0.4760	0.5370	+0.2417	+15	−71

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

APRIL.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1916.0. Δα	Red'ns from 1916.0. Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle, *H*	*Y*	*x′*	*y′*	N.	S.
		s	″	° ′	d h m	h m				°	°
θ Aquarii	4.3	+1.34	+ 4.0	− 8 12.0	26 10 34.1	− 9 20.0	−0.3342	0.5311	+0.2502	+23	−61
150 B. Aquarii	6.0	1.35	4.4	9 27.5	10 35.3	− 9 18.9	+0.9674	0.5311	0.2502	+81	+10
ρ Aquarii	5.3	1.32	4.1	8 14.5	12 11.6	− 7 45.6	+0.1159	0.5303	0.2512	+47	−36
170 B. Aquarii	6.0	1.30	4.1	7 37.1	13 48.6	− 6 11.7	−0.1214	0.5296	0.2522	+34	−49
186 B. Aquarii	6.1	1.26	4.1	6 59.0	17 34.5	− 2 32.9	+0.1758	0.5279	0.2542	+51	−33
6 G. Piscium	6.2	+1.09	+ 3.9	− 2 50.7	27 6 50.7	+10 18.4	−0.7068	0.5234	+0.2588	+ 5	−90
22 B. Piscium	6.4	0.96	4.1	− 0 10.1	19 26.9	− 1 28.5	−0.2227	0.5206	0.2598	+31	−55
κ Piscium	4.9	0.95	4.0	+ 0 47.8	21 9.3	+ 0 10.8	−0.7874	0.5203	0.2597	+ 1	−89
9 Piscium	6.4	0.94	4.0	0 39.7	21 18.9	+ 0 20.0	−0.6057	0.5203	0.2597	+11	−81
16 Piscium	5.7	0.90	4.1	1 38.2	28 1 54.8	+ 4 47.5	−0.4319	0.5197	0.2591	+20	−68
λ Piscium	4.6	+0.88	+ 4.3	+ 1 19.1	4 45.7	+ 7 33.2	+0.6381	0.5195	+0.2585	+84	− 9
19 Piscium	5.4	0.85	4.1	3 1.3	6 56.8	+ 9 40.3	−0.5811	0.5194	0.2580	+12	−78
22 Piscium	5.8	0.84	4.4	2 27.9	9 45.0	−11 36.6	+0.7254	0.5193	0.2571	+90	− 4
d Piscium	5.4	0.72	4.2	7 43.5	29 0 10.3	+ 2 22.4	−1.1414	0.5199	0.2505	−22	−82
136 B. Piscium	6.5	+0.66	+ 4.6	+ 8 53.9	10 30.7	−11 36.1	+0.1719	0.5214	+0.2432	+52	−31
				NEW	***MOON.***						

MAY.

χ Tauri	5.3	+0.74	+ 7.1	+25 26.0	3 18 52.1	− 6 38.1	+0.1289	0.5512	+0.0684	+50	−14
112 B. Aurigæ	5.7	1.04	6.5	26 52.5	5 4 12.2	+ 1 33.1	−0.4974	0.5499	−0.0111	+14	−44
125 Tauri	5.1	1.05	6.3	25 51.2	5 23.2	+ 2 41.7	+0.6165	0.5496	0.0139	+89	+17
139 Tauri	4.7	1.14	5.9	25 56.8	13 37.5	+10 39.0	+0.3189	0.5478	0.0333	+62	− 1
Venus	−4.1	. . .	. . .	27 6.8	17 32.8	− 9 33.6	−1.1253	0.5088	0.0428	−31	−63
52 B. Geminorum	6.5	+1.32	+ 4.4	+24 39.8	6 7 41.4	+ 4 6.4	+0.7653	0.5419	−0.0742	+90	+19
ε Geminorum	3.2	1.36	4.4	25 13.0	10 40.8	+ 6 59.8	−0.0800	0.5408	0.0807	+38	−26
87 B. Geminorum	5.8	1.38	3.6	23 42.2	14 27.8	+10 39.3	+1.2766	0.5393	0.0888	+74	+60
37 Geminorum	5.7	1.42	4.0	25 29.0	15 58.6	−11 53.0	−0.8329	0.5386	0.0920	− 6	−65
ω Geminorum	5.2	1.44	3.4	24 20.2	19 19.6	− 8 38.5	+0.1170	0.5372	0.0990	+49	−18
48 Geminorum	5.8	+1.49	+ 3.0	+24 16.3	7 0 3.5	− 4 3.9	−0.3009	0.5352	−0.1086	+25	−41
52 Geminorum	6.1	1.52	3.2	25 2.0	1 6.8	− 3 2.6	−1.2608	0.5347	0.1107	−47	−65
58 Geminorum	6.0	1.54	2.2	23 6.5	5 19.4	+ 1 1.9	+0.3881	0.5328	0.1190	+67	− 6
B. D.+23° 1744	6.4	1.59	1.8	23 4.1	9 49.1	+ 5 22.9	−0.1215	0.5308	0.1276	+35	−33
187 B. Geminorum	6.3	1.63	1.5	23 12.9	13 44.4	+ 9 10.7	−0.7983	0.5290	0.1349	− 3	−67
192 B. Geminorum	6.3	+1.64	+ 1.2	+22 35.9	14 54.7	+10 18.7	−0.2757	0.5285	−0.1370	+27	−43
217 B. Geminorum	6.3	1.69	− 0.4	20 2.8	23 28.1	− 5 23.9	+1.3102	0.5247	0.1521	+74	+58
μ Cancri	5.5	1.76	0.2	21 49.6	8 2 52.6	− 2 5.9	−1.1855	0.5231	0.1578	−32	−68
Neptune	7.7	. . .	. . .	19 52.5	5 50.7	+ 0 46.8	+0.4957	0.5212	0.1626	+74	− 5
49 B. Cancri	6.0	1.81	1.0	21 0.8	9 8.9	+ 3 58.8	−1.3074	0.5204	0.1679	−49	−69
d^1 Cancri	5.9	+1.79	− 2.0	+18 36.1	10 42.0	+ 5 29.0	+1.0927	0.5198	−0.1703	+90	+30
θ Cancri	5.5	1.83	2.5	18 22.7	14 50.5	+ 9 30.0	+0.6203	0.5180	0.1766	+85	0
δ Cancri	4.2	1.90	3.1	18 27.8	21 28.4	− 8 4.1	−0.6765	0.5155	0.1862	+ 5	−71
X Cancri (*var.*)	6.2	1.95	3.9	17 33.0	9 2 57.3	− 2 45.0	−0.7128	0.5135	0.1937	+ 4	−72
o^1 Cancri	5.1	1.93	4.7	15 38.7	3 56.1	− 1 48.0	+1.1927	0.5132	0.1949	+90	+35
o^2 Cancri	5.7	+1.94	− 4.6	+15 54.2	4 6.3	− 1 38.0	+0.8748	0.5131	−0.1952	+90	+12
81 Cancri	6.4	1.99	5.4	15 20.0	11 44.2	+ 5 46.3	−0.0272	0.5107	0.2048	+41	−37
π Cancri	5.6	2.02	5.7	15 17.3	13 14.3	+ 7 13.8	−0.2871	0.5103	0.2066	+27	−52
18 Leonis	5.8	2.14	8.4	12 11.7	10 5 35.2	− 0 54.0	−0.4283	0.5066	0.2240	+20	−63
19 Leonis	6.4	2.14	8.5	11 57.3	6 8.4	− 0 21.8	−0.2907	0.5065	0.2246	+27	−55
R Leonis (*var.*)	5–10	+2.14	− 8.6	+11 49.0	6 12.4	− 0 17.9	−0.1549	0.5065	−0.2246	+34	−47
A Leonis	4.6	2.22	10.0	10 24.4	16 58.8	+10 9.9	−1.0920	0.5053	0.2340	−19	−80
43 Leonis	6.3	2.26	12.0	6 58.0	11 1 0.6	− 6 2.2	+0.7274	0.5051	0.2399	+90	− 3
48 Leonis	5.2	2.32	12.2	7 23.0	7 15.7	+ 0 2.1	−1.2337	0.5054	0.2439	−30	−83
35 Sextantis	6.1	2.34	13.4	5 11.1	11 47.6	+ 4 26.2	+0.0186	0.5058	0.2464	+43	−40
d Leonis	5.0	+2.41	−14.4	+ 4 3.9	20 52.7	−10 44.5	−1.0376	0.5073	−0.2506	−15	−86

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MAY.

The Star's						At Conjunction in R. A.					Limiting Parallels.	
	Name.	Mag.	Red'ns from 1916.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
			$\Delta\alpha$	$\Delta\delta$								
			s	″	° ′	d h m	h m				°	°
p^4	Leonis	5.7	+2.42	−15.2	+ 2 24.5	**12** 0 14.1	− 7 28.9	−0.1117	0.5081	−0.2518	+36	−48
p^5	Leonis	5.3	2.45	16.1	0 23.0	3 48.9	− 4 0.3	+1.1398	0.5091	0.2528	+90	+22
76	Leonis	6.0	2.48	15.7	2 6.4	6 29.9	− 1 23.9	−1.3715	0.5099	0.2535	−46	−80
359 B.	Leonis	6.3	2.49	16.3	+ 0 35.3	8 46.9	+ 0 49.0	−0.3390	0.5106	0.2540	+25	−62
388 B.	Leonis	6.3	2.50	17.0	− 1 14.5	11 10.2	+ 3 8.1	+0.9939	0.5114	0.2544	+89	+12
υ	Leonis	4.5	+2.55	−17.0	− 0 21.9	15 50.2	+ 7 39.8	−1.1225	0.5132	−0.2549	−21	−90
431 B.	Leonis	6.2	2.55	17.5	1 58.6	16 35.2	+ 8 23.4	+0.3877	0.5136	0.2550	+65	−22
78 B.	Virginis	6.5	2.71	19.1	5 15.4	**13** 10 41.9	+ 1 57.3	−0.7745	0.5229	0.2528	+ 1	−90
q	Virginis	5.3	2.79	20.2	8 59.7	20 15.5	+11 12.9	+0.7132	0.5292	0.2489	+81	− 5
370 B.	Virginis	6.0	2.89	20.8	11 11.9	**14** 6 3.7	− 3 17.7	+0.5764	0.5366	0.2427	+73	−12
75	Virginis	5.6	+3.08	−21.0	−14 56.2	23 42.9	−10 14.0	+0.2591	0.5518	−0.2253	+51	−28
83	Virginis	5.6	3.13	20.9	15 45.8	**15** 4 51.0	− 5 16.6	−0.0411	0.5565	0.2187	+34	−44
85	Virginis	6.1	3.14	20.8	15 21.1	5 20.0	− 4 48.7	−0.5640	0.5571	0.2180	+ 7	−79
43 H.	Virginis	5.5	3.28	20.3	17 48.9	18 5.1	+ 7 28.8	−0.7225	0.5693	0.1978	− 5	−90
231 G.	Virginis	6.4	3.29	20.2	18 12.1	18 46.6	+ 8 8.7	−0.4690	0.5700	0.1966	+ 9	−72
236 G.	Virginis	5.7	+3.29	−20.2	−18 20.0	19 26.1	+ 8 46.8	−0.4652	0.5706	−0.1954	+ 9	−71
9 G.	Libræ	6.5	3.38	19.8	20 4.6	**16** 2 6.3	− 8 48.1	+0.0295	0.5771	0.1826	+33	−40
17 G.	Libræ	6.4	3.43	19.3	20 49.6	6 41.5	− 4 23.4	−0.0343	0.5815	0.1730	+28	−44
18 G.	Libræ	6.1	3.43	19.2	20 58.7	7 6.5	− 3 59.3	+0.0469	0.5818	0.1721	+32	−40
43 B.	Libræ	5.7	3.50	19.4	21 2.6	11 9.0	− 0 6.3	−0.5652	0.5856	0.1630	0	−81
47 G.	Libræ	6.1	+3.51	−18.3	−21 42.6	14 43.5	+ 3 19.7	−0.4646	0.5888	−0.1546	+ 4	−72
64 G.	Libræ	5.8	3.54	17.7	22 5.6	18 35.7	+ 7 2.7	−0.6610	0.5922	0.1450	− 7	−90
153 B.	Libræ	6.3	3.62	16.7	24 12.6	**17** 1 0.7	−10 47.9	+0.5701	0.5975	0.1283	+58	−10
169 B.	Libræ	6.0	3.60	16.4	22 52.1	2 47.7	− 9 5.3	−0.9895	0.5988	0.1234	−30	−90
177 B.	Libræ	6.2	3.61	16.3	22 52.8	3 23.1	− 8 31.4	−1.0490	0.5993	0.1218	−34	−90
42	Libræ	5.0	+3.63	−16.2	−23 33.0	3 43.6	− 8 11.8	−0.4241	0.5995	−0.1208	+ 3	−70
b	Scorpii	4.7	3.69	15.5	25 30.1	7 43.8	− 4 21.5	+1.0540	0.6025	0.1095	+64	+22
A	Scorpii	4.6	3.69	15.3	25 4.9	8 43.2	− 3 24.6	+0.5294	0.6031	0.1067	+53	−12
31 B.	Scorpii	5.4	3.67	15.3	24 17.3	8 50.2	− 3 17.8	−0.2711	0.6032	0.1063	+ 9	−59
32 B.	Scorpii	5.3	3.66	15.3	23 44.0	8 51.4	− 3 16.8	−0.8248	0.6032	0.1063	−21	−90
3	Scorpii	5.9	+3.69	−15.2	−25 0.0	9 6.7	− 3 2.1	+0.4068	0.6034	−0.1055	+46	−19
40 B.	Scorpii	5.4	3.69	14.9	24 35.6	10 34.8	− 1 37.7	−0.1480	0.6044	0.1013	+15	−51
π	Scorpii	3.0	3.72	14.9	25 52.6	10 39.9	− 1 32.7	+1.1178	0.6044	0.1010	+64	+29
48 B.	Scorpii	4.9	3.72	14.6	25 38.2	12 20.4	+ 0 3.5	+0.7128	0.6055	0.0961	+64	− 1
50 B.	Scorpii	6.4	3.69	14.6	24 30.0	12 33.7	+ 0 16.3	−0.4366	0.6056	0.0954	0	−71
24 G.	Scorpii	6.2	+3.69	−14.3	−24 14.5	14 1.8	+ 1 40.6	−0.8285	0.6065	−0.0910	−22	−90
65 B.	Scorpii	5.5	3.74	14.2	26 6.4	14 5.9	+ 1 44.5	+1.0145	0.6065	0.0908	+64	+20
41 G.	Scorpii	6.3	3.70	13.8	24 12.7	16 12.3	+ 3 45.6	−1.0486	0.6077	0.0844	−38	−90
85 B.	Scorpii	6.0	3.73	13.7	25 16.1	16 36.5	+ 4 8.7	−0.0350	0.6079	0.0831	+19	−44
σ	Scorpii	3.1	3.74	13.2	25 23.8	18 55.1	+ 6 21.5	−0.0923	0.6091	0.0760	+16	−48
α	Scorpii	1.2	+3.77	−12.5	−26 15.0	21 54.8	+ 9 13.5	+0.5403	0.6105	−0.0666	+51	−12
22	Scorpii	4.8	3.73	12.5	24 56.1	22 13.4	+ 9 31.2	−0.7832	0.6106	0.0657	−22	−90
116 B.	Scorpii	6.2	3.77	12.4	26 21.5	22 38.0	+ 9 54.8	+0.6012	0.6108	0.0643	+55	− 8
134 B.	Scorpii	6.4	3.81	11.2	27 18.1	**18** 3 18.7	− 9 36.6	+1.2684	0.6125	0.0494	+63	+55
88 B.	Ophiuchi	6.3	3.74	10.1	24 58.1	9 0.6	− 4 9.5	−1.2696	0.6140	0.0308	−64	−70
118 B.	Ophiuchi	6.2	+3.78	− 9.4	−26 24.2	11 29.2	− 1 47.3	+0.0834	0.6144	−0.0226	+20	−37
137 B.	Ophiuchi	6.3	3.75	9.1	25 9.3	13 25.8	+ 0 4.3	−1.1888	0.6147	0.0162	−55	−88
36	Ophi. (*1st star*)	5.4	3.77	9.1	26 29.0	14 33.1	+ 1 8.6	+0.1088	0.6147	−0.0125	+21	−36
136 G.	Ophiuchi	6.3	3.76	7.7	25 52.3	18 42.5	+ 5 7.1	−0.5187	0.6148	+0.0013	−13	−78
151 G.	Ophiuchi	6.0	3.76	7.2	26 12.5	20 26.3	+ 6 46.4	−0.1792	0.6147	0.0070	+ 5	−53
4 G.	Sagittarii	6.2	+3.76	− 5.6	−26 56.9	**19** 2 27.2	−11 28.3	+0.6543	0.6138	+0.0269	+57	− 5
66 B.	Sagittarii	4.7	3.70	2.9	27 4.5	13 11.2	− 1 12.2	+1.2572	0.6104	0.0617	+63	+51
67 B.	Sagittarii	6.4	3.66	3.1	25 38.3	13 26.5	− 0 57.6	−0.1489	0.6103	0.0624	+12	−51
70 B.	Sagittarii	6.4	3.63	3.0	24 57.3	14 29.2	+ 0 2.4	−0.7584	0.6098	0.0658	−20	−90
68 G.	Sagittarii	6.2	3.66	2.1	26 41.2	16 44.1	+ 2 11.5	+1.1116	0.6087	0.0728	+63	+29
λ	*Sagittarii*	2.9	+3.63	− 2.4	−25 28.2	16 50.6	+ 2 17.9	−0.0848	0.6086	+0.0731	+16	−47

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MAY.

The Star's					At Conjunction in R. A.						Limiting Parallels.	
Name.	Mag.	Red'ns from 1916.0.		Apparent Declination.	Greenwich Mean Time.		Hour Angle, *H*	*Y*	*x′*	*y′*	N.	S.
		Δα	Δδ									
		s	″	° ′	d	h m	h m				°	°
G. Sagittarii	6.3	+3.67	-2.0	-26 48.5	**19**	16 52.3	+ 2 19.5	+1.2433	0.6086	+0.0732	+63	+47
B. Sagittarii	6.5	3.66	2.0	26 38.2		17 11.1	+ 2 37.4	+1.0960	0.6085	0.0742	+63	+27
Sagittarii	5.7	3.57	2.1	24 5.8		19 2.3	+ 4 23.9	-1.2774	0.6075	0.0799	-63	-71
Sagittarii	6.1	3.54	1.4	23 54.8		21 59.1	+ 7 13.2	-1.2112	0.6058	0.0889	-52	-87
B. Sagittarii	5.7	3.57	-0.9	25 5.8		23 4.1	+ 8 15.5	+0.0601	0.6051	0.0921	+25	-39
B. Sagittarii	6.4	+3.52	+0.3	-24 59.4	**20**	4 6.9	-10 54.5	+0.4570	0.6018	+0.1070	+49	-17
G. Sagittarii	6.4	3.51	0.5	25 3.6		4 53.5	-10 9.8	+0.6104	0.6013	0.1092	+59	- 8
B. Sagittarii	5.8	3.50	0.6	24 57.8		5 40.0	- 9 25.3	+0.6005	0.6007	0.1114	+59	- 9
B. Sagittarii	6.1	3.47	1.1	24 47.3		7 51.1	- 7 19.6	+0.6778	0.5991	0.1175	+64	- 4
B. Sagittarii	6.5	3.43	0.8	23 19.4		8 3.7	- 7 7.5	-0.7533	0.5990	0.1181	-15	-90
B. Sagittarii	6.1	+3.43	+1.6	-24 19.4		10 37.9	- 4 39.7	+0.5525	0.5970	+0.1252	+57	-11
B. Sagittarii	5.5	3.35	1.7	22 33.6		12 36.3	- 2 46.1	-0.9489	0.5954	0.1305	-26	-90
Sagittarii	5.5	3.38	2.4	24 7.6		14 27.0	- 0 59.9	+0.8562	0.5939	0.1354	+66	+ 7
Sagittarii	5.5	3.32	1.9	21 56.6		14 47.8	- 0 40.0	-1.2699	0.5936	0.1363	-54	-80
Sagittarii	6.3	3.31	3.5	23 37.1		20 1.2	+ 4 20.9	+1.1456	0.5893	0.1495	+66	+30
B. Sagittarii	6.1	+3.31	+3.5	-23 37.3		20 8.1	+ 4 27.5	+1.1654	0.5892	+0.1498	+66	+32
Capricorni	5.5	3.01	5.4	19 22.8	**21**	11 55.9	- 4 21.5	-0.4176	0.5749	0.1850	+10	-68
Capricorni	5.2	2.95	5.7	18 29.2		15 12.9	- 1 12.0	-0.6968	0.5719	0.1914	- 4	-90
Capricorni	5.0	2.93	5.7	18 5.4		15 51.6	- 0 34.7	-0.9701	0.5713	0.1926	-21	-90
Capricorni	5.6	2.94	6.0	18 51.6		16 16.9	- 0 10.3	-0.1161	0.5709	0.1934	+27	-49
Capricorni	5.3	+2.88	+6.6	-18 26.0		20 32.7	+ 3 56.0	+0.2959	0.5670	+0.2011	+49	-26
B. Capricorni	6.4	2.83	7.2	18 20.7	**22**	0 29.6	+ 7 44.2	+1.0146	0.5634	0.2077	+72	+16
B. Capricorni	5.7	2.74	7.2	16 21.2		4 5.8	+11 12.6	-0.2338	0.5602	0.2133	+23	-56
Capricorni	5.5	2.62	8.0	15 31.1		12 0.9	- 5 9.1	+0.6578	0.5533	0.2244	+73	- 7
B. Aquarii	6.5	2.59	7.4	13 32.9		12 8.7	- 5 1.6	-1.3081	0.5532	0.2246	-46	-84
Aquarii	5.5	+2.54	+7.8	-13 14.2		15 47.8	- 1 30.1	-0.7976	0.5501	+0.2291	- 5	-90
Capricorni	5.5	2.38	8.6	11 45.1	**23**	1 57.9	+ 8 19.2	+0.0766	0.5423	0.2398	+43	-38
B. Aquarii	6.5	2.33	8.6	10 42.3		5 14.7	+11 29.6	-0.1995	0.5399	0.2427	+29	-53
Aquarii	4.3	2.17	8.8	8 12.0		16 12.2	- 1 54.4	-0.0607	0.5328	0.2504	+37	-46
B. Aquarii	6.0	2.18	9.3	9 27.4		16 13.4	- 1 53.3	+1.2344	0.5328	0.2504	+81	+31
Aquarii	5.3	+2.14	+9.0	- 8 14.5		17 49.0	- 0 20.8	+0.3867	0.5318	+0.2514	+62	-22
B. Aquarii	6.0	2.12	9.0	7 37.0		19 25.3	+ 1 12.4	+0.1498	0.5310	0.2522	+49	-34
B. Aquarii	6.1	2.07	9.1	6 58.9		23 9.9	+ 4 49.9	+0.4442	0.5289	0.2539	+67	-19
Aquarii	5.2	2.00	8.6	4 39.6	**24**	2 19.3	+ 7 53.3	-1.1473	0.5273	0.2551	-24	-90
G. Piscium	6.2	1.87	8.7	2 50.6		12 23.6	- 6 21.4	-0.4453	0.5230	0.2576	+19	-69
B. Piscium	6.4	+1.72	+8.8	- 0 10.0	**25**	1 0.3	+ 5 52.1	+0.0247	0.5192	+0.2579	+44	-41
Piscium	4.9	1.70	8.5	+ 0 47.9		2 43.0	+ 7 31.5	-0.5422	0.5189	0.2576	+14	-76
Piscium	6.4	1.70	8.6	0 39.8		2 52.5	+ 7 40.9	-0.3606	0.5188	0.2576	+23	-63
Piscium	5.7	1.64	8.6	1 38.3		7 29.4	-11 50.6	-0.1930	0.5179	0.2568	+32	-53
Piscium	4.6	1.61	8.8	1 19.2		10 21.0	- 9 4.2	+0.8740	0.5175	0.2561	+90	+ 5
Piscium	5.4	+1.58	+8.4	+ 3 1.4		12 32.7	- 6 56.4	-0.3496	0.5173	+0.2554	+24	-62
Piscium	5.8	1.56	8.8	2 28.0		15 21.9	- 4 12.4	+0.9544	0.5170	0.2544	+90	+10
Piscium	5.4	1.41	7.9	7 43.6	**26**	5 53.3	+ 9 52.9	-0.9405	0.5169	0.2472	- 9	-82
B. Piscium	6.5	1.31	8.0	8 53.9		16 19.2	- 4 0.1	+0.3573	0.5180	0.2398	+63	-22
Piscium	6.3	1.21	7.5	12 30.5	**27**	5 3.6	+ 8 21.0	-0.5029	0.5205	0.2281	+16	-67
Piscium	3.7	+1.13	+7.3	+14 54.9		17 26.7	- 3 38.6	-0.3394	0.5240	+0.2142	+24	-55
Piscium	6.2	1.12	7.5	14 14.1		19 34.2	- 1 35.1	+0.8436	0.5247	0.2115	+90	+ 9
Piscium	6.1	1.10	7.2	15 58.9		21 28.6	+ 0 15.7	-0.6324	0.5254	0.2090	+ 9	-72
Arietis	6.4	1.08	7.1	16 59.7	**28**	0 51.6	+ 3 32.6	-1.0221	0.5265	0.2045	-16	-73
Arietis	5.8	1.08	7.2	16 32.4		1 38.7	+ 4 18.2	-0.3730	0.5268	0.2035	+22	-56
Arietis	5.1	+1.06	+7.1	+17 24.6		6 6.7	+ 8 37.7	-0.4157	0.5284	+0.1972	+20	-57
B. Arietis	6.4	1.04	7.1	17 51.1		9 11.9	+11 37.1	-0.2915	0.5296	0.1926	+26	-50
B. Arietis	6.5	1.03	7.2	17 37.9		11 9.7	-10 28.9	+0.3219	0.5303	0.1897	+61	-17
H^1. Arietis	6.4	1.03	7.3	16 50.0		11 56.7	- 9 43.3	+1.3329	0.5306	0.1884	+75	+56
Arietis	5.9	1.02	6.9	19 6.4		12 31.5	- 9 9.6	-1.0140	0.5308	0.1876	-16	-71
Arietis	5.6	+1.01	+7.0	+19 30.9		16 8.0	- 5 40.0	-0.7903	0.5322	+0.1819	[illegible]	[illegible]

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MAY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1916.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	″	° ′	d h m	h m				°	°
26 Arietis	6.2	+0.99	+ 7.0	+19 29.1	28 22 6.6	+ 0 7.1	+0.2993	0.5345	+0.1720	+60	-16
μ Arietis	5.7	+0.97	+ 7.1	+19 39.4	29 3 40.2	+ 5 29.9	+1.0442	0.5368	+0.1622	+90	+28
				NEW	*MOON.*						
JUNE.											
52 B. Geminorum	6.5	+1.22	+ 3.7	+24 39.8	2 14 34.9	-11 12.5	+0.6123	0.5431	-0.0759	+87	+10
ε Geminorum	3.2	1.24	3.6	25 13.0	17 34.5	- 8 18.9	-0.2396	0.5419	0.0824	+28	-35
87 B. Geminorum	5.8	1.26	3.1	23 42.2	21 21.7	- 4 39.2	+1.1138	0.5404	0.0905	+90	+41
37 Geminorum	5.7	+1.28	+ 3.3	+25 29.0	22 52.7	- 3 11.2	-1.0026	0.5398	-0.0936	-18	-65
ω Geminorum	5.2	1.30	2.8	24 20.2	3 2 13.9	+ 0 3.4	-0.0559	0.5383	0.1006	+39	-27
48 Geminorum	5.8	1.33	2.5	24 16.3	6 58.3	+ 4 38.4	-0.4820	0.5362	0.1102	+15	-52
58 Geminorum	6.0	1.36	1.9	23 6.5	12 14.8	+ 9 44.8	+0.2007	0.5337	0.1205	+54	-16
B. D.+23° 1744	6.4	1.39	1.5	23 4.1	16 45.1	- 9 53.5	-0.3166	0.5316	0.1290	+25	-44
187 B. Geminorum	6.3	+1.42	+ 1.3	+23 12.9	20 41.1	- 6 5.1	-1.0008	0.5296	-0.1363	-17	-67
192 B. Geminorum	6.3	1.42	+ 1.0	22 35.9	21 51.6	- 4 56.8	-0.4783	0.5291	0.1384	+16	-55
217 B. Geminorum	6.3	1.46	- 0.3	20 2.8	4 6 26.9	+ 3 22.5	+1.1015	0.5249	0.1532	+90	+33
Neptune	7.8	. . .	. . .	19 45.4	14 5.4	+10 46.8	+0.2049	0.5200	0.1653	+54	-21
d^1 Cancri	5.9	1.54	1.6	18 36.1	17 44.2	- 9 41.1	+0.8706	0.5194	0.1712	+90	+14
θ Cancri	5.5	+1.57	- 2.0	+18 22.7	21 54.3	- 5 38.5	+0.3919	0.5175	-0.1773	+66	-13
δ Cancri	4.2	1.63	2.6	18 27.8	5 4 35.1	+ 0 50.3	-0.9176	0.5145	0.1866	- 9	-72
X Cancri (*var.*)	6.2	1.66	3.2	17 33.1	10 6.8	+ 6 12.1	-0.9595	0.5122	0.1939	-12	-72
o^1 Cancri	5.1	1.65	3.9	15 38.7	11 6.2	+ 7 9.7	+0.9553	0.5118	0.1951	+90	+16
o^2 Cancri	5.7	1.66	3.8	15 54.2	11 16.5	+ 7 19.8	+0.6356	0.5117	0.1954	+88	- 3
81 Cancri	6.4	+1.70	- 4.6	+15 20.0	18 58.9	- 9 11.4	-0.2774	0.5088	-0.2046	+27	-51
π Cancri	5.6	1.72	4.8	15 17.4	20 30.0	- 7 42.9	-0.5398	0.5083	0.2063	+14	-67
18 Leonis	5.8	1.83	7.2	12 11.7	6 13 3.6	+ 8 22.1	-0.6914	0.5035	0.2229	+ 7	-78
19 Leonis	6.4	1.83	7.3	11 57.3	13 37.3	+ 8 54.9	-0.5530	0.5034	0.2234	+13	-71
R Leonis (*var.*)	5-10	1.83	7.3	11 49.0	13 41.3	+ 8 58.7	-0.4162	0.5033	0.2234	+20	-62
83 B. Leonis	5.9	+1.84	- 8.5	+ 9 19.8	18 28.4	-10 22.4	+1.2319	0.5024	-0.2275	+90	+33
A Leonis	4.6	1.92	8.7	10 24.4	7 0 38.0	- 4 23.2	-1.3641	0.5014	0.2323	-48	-76
43 Leonis	6.3	1.96	10.5	6 58.0	8 48.4	+ 3 33.3	+0.4710	0.5006	0.2377	+71	-16
155 B. Leonis	6.5	1.94	10.8	6 7.1	8 57.0	+ 3 41.8	+1.3613	0.5006	0.2378	+81	+48
35 Sextantis	6.1	2.05	11.9	5 11.1	19 48.1	- 9 45.4	-0.2424	0.5006	0.2437	+30	-55
d Leonis	5.0	+2.13	-12.9	+ 4 3.9	8 5 4.8	- 0 44.6	-1.3057	0.5016	-0.2474	-37	-86
p^4 Leonis	5.7	2.14	13.7	2 24.5	8 30.7	+ 2 35.5	-0.3683	0.5022	0.2484	+23	-63
p^5 Leonis	5.3	2.17	14.6	0 23.0	12 10.3	+ 6 8.9	+0.8987	0.5030	0.2493	+90	+ 6
359 B. Leonis	6.3	2.22	14.8	+ 0 35.4	17 15.3	+11 5.2	-0.5920	0.5043	0.2502	+11	-80
388 B. Leonis	6.3	2.24	15.6	- 1 14.5	19 41.9	-10 32.4	+0.7572	0.5050	0.2505	+90	- 3
υ Leonis	4.5	+2.30	-15.5	- 0 21.8	9 0 28.6	- 5 53.9	-1.3780	0.5067	-0.2509	-47	-80
431 B. Leonis	6.2	2.29	16.1	1 58.6	1 14.7	- 5 9.1	+0.1495	0.5070	0.2509	+50	-34
78 B. Virginis	6.5	2.49	17.9	5 15.4	19 47.8	-11 8.8	-1.0040	0.5159	0.2483	-14	-90
q Virginis	5.3	2.59	19.4	8 59.6	10 5 35.1	- 1 39.5	+0.5139	0.5222	0.2443	+71	-15
370 B. Virginis	6.0	2.72	20.2	11 11.9	15 37.0	+ 8 3.6	+0.3916	0.5297	0.2382	+61	-22
69 Virginis	4.9	+2.94	-21.2	-15 32.7	11 7 10.5	- 0 53.3	+1.2790	0.5432	-0.2240	+74	+39
75 Virginis	5.6	2.97	20.9	14 56.2	9 38.7	+ 1 29.9	+0.1033	0.5456	0.2211	+42	-37
83 Virginis	5.6	3.06	20.9	15 45.8	14 52.6	+ 6 32.9	-0.1893	0.5506	0.2146	+26	-53
85 Virginis	6.1	3.06	20.8	15 21.1	15 22.0	+ 7 1.4	-0.7154	0.5511	0.2140	- 2	-90
87 Virginis	5.8	3.09	21.3	17 26.8	16 9.9	+ 7 47.7	+1.2579	0.5519	0.2129	+73	+37
89 Virginis	5.1	+3.10	-21.3	-17 43.3	17 15.4	+ 8 50.8	+1.3083	0.5530	-0.2114	+72	+45
43 H. Virginis	5.5	3.26	20.5	17 48.9	12 4 19.6	- 4 28.6	-0.8477	0.5644	0.1943	-11	-90
231 G. Virginis	6.4	3.28	20.5	18 12.1	5 1.7	- 3 48.1	-0.5911	0.5651	0.1931	+ 2	-82
236 G. Virginis	5.7	3.29	20.5	18 20.0	5 41.8	- 3 9.4	-0.5858	0.5658	0.1919	+ 2	-82
9 G. Libræ	6.5	3.41	20.3	20 4.6	12 27.1	+ 3 20.8	-0.0740	0.5729	0.1794	+27	-46
17 G. Libræ	6.4	+3.48	-19.9	-20 49.6	17 5.3	+ 7 48.5	-0.1283	0.5778	-0.1700	+23	-50

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JUNE.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1916.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
18 G. Libræ	6.1	+3.49	−19.9	−20 58.7	12 17 30.5	+ 8 12.8	−0.0458	0.5782	−0.1691	+27	−45
43 B. Libræ	5.7	3.58	20.2	21 2.6	21 35.3	−11 51.9	−0.6515	0.5824	0.1602	− 5	−90
47 G. Libræ	6.1	3.62	19.0	21 42.7	13 1 11.4	− 8 24.2	−0.5427	0.5861	0.1519	0	−79
64 G. Libræ	5.8	3.67	18.4	22 5.7	5 5.1	− 4 39.8	−0.7310	0.5899	0.1425	−12	−90
153 B. Libræ	6.3	3.80	17.7	24 12.6	11 31.7	+ 1 31.3	+0.5159	0.5961	0.1259	+54	−13
169 B. Libræ	6.0	+3.80	−17.2	−22 52.1	13 19.0	+ 3 14.2	−1.0411	0.5977	−0.1211	−34	−90
177 B. Libræ	6.2	3.80	17.1	22 52.9	13 54.4	+ 3 48.1	−1.0993	0.5982	0.1195	−38	−90
42 Libræ	5.0	3.82	17.1	23 33.0	14 15.0	+ 4 7.8	−0.4734	0.5985	0.1186	0	−73
b Scorpii	4.7	3.92	16.6	25 30.1	18 15.4	+ 7 58.3	+1.0130	0.6020	0.1074	+64	+19
A Scorpii	4.6	3.92	16.4	25 4.9	19 14.8	+ 8 55.3	+0.4906	0.6028	0.1046	+51	−15
31 B. Scorpii	5.4	+3.90	−16.2	−24 17.3	19 21.8	+ 9 2.0	−0.3092	0.6029	−0.1042	+ 8	−61
32 B. Scorpii	5.3	3.88	16.2	23 44.0	19 22.9	+ 9 3.0	−0.8626	0.6029	0.1042	−23	−90
3 Scorpii	5.9	3.92	16.3	25 0.0	19 38.3	+ 9 17.7	+0.3689	0.6031	0.1034	+43	−22
40 B. Scorpii	5.4	3.93	15.9	24 35.6	21 6.3	+10 42.1	−0.1825	0.6043	0.0992	+14	−53
π Scorpii	3.0	3.96	16.1	25 52.7	21 11.4	+10 47.0	+1.0824	0.6044	0.0989	+64	+25
48 B. Scorpii	4.9	+3.97	−15.7	−25 38.2	22 51.7	−11 36.9	+0.6810	0.6057	−0.0940	+62	− 3
50 B. Scorpii	6.4	3.95	15.5	24 30.0	23 5.1	−11 24.1	−0.4665	0.6058	0.0934	− 2	−73
24 G. Scorpii	6.2	3.96	15.1	24 14.5	14 0 32.9	−10 0.1	−0.8546	0.6069	0.0890	−24	−90
65 B. Scorpii	5.5	4.01	15.3	26 6.4	0 37.0	− 9 56.2	+0.9856	0.6069	0.0888	+64	+17
41 G. Scorpii	6.3	3.98	14.6	24 12.7	2 43.0	− 7 55.6	−1.0694	0.6085	0.0824	−39	−90
85 B. Scorpii	6.0	+4.02	−14.6	−25 16.1	3 7.1	− 7 32.5	−0.0569	0.6087	−0.0812	+17	−45
σ Scorpii	3.1	4.04	14.2	25 23.8	5 25.3	− 5 20.1	−0.1094	0.6103	0.0741	+14	−49
α Scorpii	1.2	4.10	13.5	26 15.0	8 24.0	− 2 29.1	+0.5275	0.6121	0.0647	+50	−12
22 Scorpii	4.8	4.06	13.3	24 56.1	8 42.5	− 2 11.5	−0.7913	0.6123	0.0638	−22	−90
116 B. Scorpii	6.2	4.10	13.4	26 21.6	9 6.9	− 1 48.1	+0.5895	0.6125	0.0625	+54	− 9
134 B. Scorpii	6.4	+4.18	−12.3	−27 18.2	13 45.7	+ 2 38.7	+1.2629	0.6150	−0.0475	+63	+53
88 B. Ophiuchi	6.3	4.15	10.7	24 58.1	19 24.4	+ 8 2.5	−1.2516	0.6172	0.0289	−61	−90
118 B. Ophiuchi	6.2	4.22	10.0	26 24.2	21 51.4	+10 23.0	+0.0991	0.6180	0.0207	+21	−36
137 B. Ophiuchi	6.3	4.19	9.5	25 9.3	23 46.6	−11 46.8	−1.1614	0.6185	0.0143	−53	−90
36 Ophi. (*1st star*)	5.4	4.22	9.7	26 29.0	15 0 53.0	−10 43.4	+0.1304	0.6188	−0.0106	+22	−35
136 G. Ophiuchi	6.3	+4.24	− 8.1	−25 52.3	4 59.1	− 6 48.2	−0.4847	0.6194	+0.0033	−10	−75
151 G. Ophiuchi	6.0	4.26	7.6	26 12.5	6 41.4	− 5 10.4	−0.1441	0.6195	0.0091	+ 7	−51
4 G. Sagittarii	6.2	4.30	5.9	26 56.9	12 36.6	+ 0 29.1	+0.6940	0.6195	0.0291	+60	− 2
63 Ophiuchi	6.1	4.23	5.3	24 52.4	14 55.4	+ 2 41.8	−1.2635	0.6193	0.0369	−62	−90
67 B. Sagittarii	6.4	4.26	2.8	25 38.3	23 23.2	+10 47.1	−0.0814	0.6172	0.0650	+15	−47
70 B. Sagittarii	6.4	+4.24	− 2.5	−24 57.3	16 0 24.5	+11 45.9	−0.6826	0.6169	+0.0684	−16	−90
68 G. Sagittarii	6.2	4.30	1.8	26 41.2	2 36.6	−10 7.9	+1.1716	0.6160	0.0755	+63	+35
λ Sagittarii	2.9	4.25	1.9	25 28.2	2 42.9	−10 1.9	−0.0117	0.6160	0.0758	+20	−43
86 B. Sagittarii	6.5	4.29	1.7	26 38.2	3 2.9	− 9 42.7	+1.1568	0.6158	0.0769	+63	+34
24 Sagittarii	5.7	4.20	1.3	24 5.8	4 51.7	− 7 58.6	−1.1868	0.6150	0.0827	−50	−90
26 Sagittarii	6.1	+4.19	− 0.5	−23 54.8	7 44.3	− 5 13.5	−1.1157	0.6136	+0.0918	−42	−90
126 B. Sagittarii	5.7	4.23	− 0.1	25 5.8	8 47.9	− 4 12.7	+0.1429	0.6131	0.0951	+30	−34
154 B. Sagittarii	5.9	4.15	+ 0.9	23 16.9	12 53.5	− 0 17.7	−1.2203	0.6107	0.1077	−52	−90
162 B. Sagittarii	6.4	4.21	1.3	24 59.4	13 43.2	+ 0 29.9	+0.5437	0.6102	0.1102	+55	−12
127 G. Sagittarii	6.4	4.21	1.6	25 3.6	14 28.6	+ 1 13.4	+0.6966	0.6097	0.1124	+64	− 3
172 B. Sagittarii	5.8	+4.20	+ 1.7	−24 57.8	15 14.0	+ 1 56.7	+0.6881	0.6092	+0.1147	+64	− 3
189 B. Sagittarii	6.1	4.18	2.3	24 47.3	17 21.6	+ 3 59.0	+0.7681	0.6078	0.1209	+65	+ 2
191 B. Sagittarii	6.5	4.13	2.2	23 19.4	17 33.8	+ 4 10.8	−0.6443	0.6077	0.1215	− 9	−90
208 B. Sagittarii	6.1	4.16	3.0	24 19.3	20 4.0	+ 6 34.5	+0.6490	0.6059	0.1287	+63	− 6
222 B. Sagittarii	5.5	4.08	3.3	22 33.5	21 59.1	+ 8 24.7	−0.8290	0.6045	0.1341	−18	−90
49 Sagittarii	5.5	+4.12	+ 4.0	−24 7.6	23 46.8	+10 7.9	+0.9549	0.6031	+0.1391	+66	+14
50 Sagittarii	5.5	4.05	3.8	21 56.6	17 0 7.0	+10 27.2	−1.1419	0.6028	0.1400	−40	−90
53 Sagittarii	6.3	4.07	5.4	23 37.1	5 11.6	− 8 40.7	+1.2489	0.5987	0.1535	+66	+42
274 B. Sagittarii	6.1	4.07	5.4	23 37.2	5 18.2	− 8 34.3	+1.2685	0.5986	0.1538	+66	+45
σ Capricorni	5.5	3.81	8.4	19 22.7	20 37.7	+ 6 8.1	−0.2670	0.5848	0.1895	+18	−58
π Capricorni	5.2	+3.76	+ 8.9	−18 29.1	23 48.6	+ 9 11.5	−0.5371	0.5817	+0.1960	+ 5	−77

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JUNE.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1916.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, *H*	*Y*	*x′*	*y′*	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
ρ Capricorni	5.0	+3.74	+ 9.0	−18 5.4	**18** 0 26.1	+ 9 47.7	−0.8053	0.5812	+0.1972	−10	−90
ο Capricorni	5.6	3.76	9.2	18 51.6	0 50.6	+10 11.2	+0.0362	0.5808	0.1980	+35	−40
υ Capricorni	5.3	3.70	10.0	18 25.9	4 58.4	− 9 50.5	+0.4477	0.5768	0.2057	+59	−17
81 B. Capricorni	6.4	3.66	10.8	18 20.6	8 47.8	− 6 9.8	+1.1605	0.5732	0.2124	+72	+28
94 B. Capricorni	5.7	3.58	11.0	16 21.1	12 17.2	− 2 48.2	−0.0639	0.5699	0.2180	+31	−46
29 Capricorni	5.5	+3.47	+12.2	−15 31.1	19 57.3	+ 4 35.0	+0.8233	0.5628	+0.2292	+74	+ 2
53 B. Aquarii	6.5	3.43	11.7	13 32.9	20 4.9	+ 4 42.3	−1.1121	0.5626	0.2293	−26	−90
18 Aquarii	5.5	3.38	12.2	13 14.2	23 37.1	+ 8 6.9	−0.6056	0.5595	0.2338	+ 6	−82
137 B. Capricorni	6.2	3.26	12.7	10 57.1	**19** 6 20.4	− 9 24.1	−1.2969	0.5537	0.2413	−42	−88
λ Capricorni	5.5	3.25	13.4	11 45.0	9 28.6	− 6 22.4	+0.2651	0.5511	0.2443	+53	−28
96 B. Aquarii	6.5	+3.19	+13.5	−10 42.2	12 39.5	− 3 18.1	−0.0042	0.5485	+0.2472	+39	−42
θ Aquarii	4.3	3.03	14.1	8 11.9	23 18.1	+ 6 58.9	+0.1402	0.5406	0.2545	+48	−35
ρ Aquarii	5.3	3.01	14.3	8 14.4	**20** 0 52.2	+ 8 30.0	+0.5824	0.5396	0.2553	+76	−12
170 B. Aquarii	6.0	2.99	14.3	7 36.9	2 25.9	+10 0.6	+0.3497	0.5386	0.2561	+60	−24
186 B. Aquarii	6.1	2.94	14.4	6 58.8	6 4.5	−10 28.0	+0.6420	0.5362	0.2577	+81	− 9
κ Aquarii	5.2	+2.87	+14.0	− 4 39.5	9 8.9	− 7 29.6	−0.9273	0.5344	+0.2587	− 8	−90
207 B. Aquarii	6.3	2.85	14.0	3 59.2	10 35.6	− 6 5.7	−1.2364	0.5336	0.2591	−31	−90
6 G. Piscium	6.2	2.74	14.3	2 50.5	18 58.4	+ 2 1.0	−0.2321	0.5292	0.2606	+30	−55
22 B. Piscium	6.4	2.59	14.4	− 0 10.0	**21** 7 18.8	−10 1.9	+0.2326	0.5242	0.2601	+55	−30
κ Piscium	4.9	2.56	14.1	+ 0 48.0	8 59.4	− 8 24.4	−0.3285	0.5236	0.2597	+25	−61
9 Piscium	6.4	+2.56	+14.2	+ 0 39.9	9 8.8	− 8 15.3	−0.1489	0.5236	+0.2597	+34	−50
16 Piscium	5.7	2.50	14.2	1 38.4	13 40.5	− 3 52.0	+0.0160	0.5223	0.2586	+43	−41
λ Piscium	4.6	2.48	14.4	1 19.3	16 29.1	− 1 8.6	+1.0722	0.5216	0.2577	+90	+17
19 Piscium	5.4	2.44	14.0	3 1.5	18 38.6	+ 0 57.0	−0.1407	0.5211	0.2569	+35	−50
22 Piscium	5.8	2.42	14.3	2 28.0	21 25.0	+ 3 38.2	+1.1509	0.5206	0.2557	+90	+23
36 Piscium	6.2	+2.28	+13.0	+ 7 46.7	**22** 9 43.5	− 8 25.9	−1.2900	0.5192	+0.2490	−37	−82
d Piscium	5.4	2.26	13.1	7 43.6	11 44.7	− 6 28.4	−0.7371	0.5191	0.2476	+ 3	−82
136 B. Piscium	6.5	2.15	12.9	8 54.0	22 4.6	+ 3 32.6	+0.5448	0.5193	0.2395	+76	−12
75 Piscium	6.3	2.04	12.0	12 30.6	**23** 10 44.0	− 8 11.1	−0.3233	0.5207	0.2272	+25	−56
η Piscium	3.7	1.94	11.3	14 55.0	23 4.8	+ 3 46.9	−0.1742	0.5233	0.2128	+33	−46
101 Piscium	6.2	+1.92	+11.5	+14 14.1	**24** 1 12.1	+ 5 50.2	+1.0037	0.5239	+0.2100	+90	+19
105 Piscium	6.1	1.91	11.0	15 59.0	3 6.4	+ 7 40.9	−0.4715	0.5245	0.2076	+17	−62
3 Arietis	6.4	1.88	10.7	16 59.7	6 29.4	+10 57.6	−0.8648	0.5253	0.2029	− 5	−73
4 Arietis	5.8	1.88	10.8	16 32.4	7 16.4	+11 43.1	−0.2178	0.5256	0.2018	+30	−46
ι Arietis	5.1	1.84	10.5	17 24.6	11 44.6	− 7 57.1	−0.2661	0.5269	0.1954	+27	−49
35 B. Arietis	6.4	+1.82	+10.4	+17 51.2	14 50.0	− 4 57.5	−0.1460	0.5279	+0.1908	+34	−41
47 B. Arietis	6.5	1.81	10.4	17 38.0	16 48.1	− 3 3.1	+0.4643	0.5286	0.1878	+71	−10
15 Arietis	5.9	1.80	10.0	19 6.4	18 10.0	− 1 43.8	−0.8726	0.5290	0.1857	− 7	−71
θ Arietis	5.6	1.78	9.8	19 31.0	21 47.1	+ 1 46.4	−0.6540	0.5303	0.1799	+ 6	−69
26 Arietis	6.2	1.74	9.8	19 29.2	**25** 3 46.8	+ 7 34.6	+0.4275	0.5324	0.1700	+69	− 9
ν Arietis	5.4	+1.72	+ 9.1	+21 36.1	7 39.4	+11 19.8	−1.2223	0.5338	+0.1633	−37	−68
μ Arietis	5.7	1.70	9.6	19 39.4	9 21.7	−11 1.3	+1.1654	0.5343	0.1602	+90	+38
ε Arietis (*mean*)	4.6	1.66	9.1	21 0.5	17 17.9	− 3 20.5	+0.9130	0.5372	0.1456	+90	+21
64 Arietis	5.8	1.61	7.9	24 25.8	**26** 4 57.2	+ 7 55.7	−1.2588	0.5412	0.1227	−45	−66
66 Arietis	6.1	1.59	8.3	22 31.1	6 53.6	+ 9 48.2	+1.0676	0.5418	0.1187	+90	+35
7 Tauri	5.9	+1.59	+ 7.9	+24 11.1	9 38.4	−11 32.4	−0.4409	0.5427	+0.1130	+18	−50
11 Tauri	6.1	1.58	7.6	25 3.6	12 32.2	− 8 44.4	−1.0822	0.5436	0.1069	−25	−65
16 Tauri	5.4	1.56	7.7	24 1.7	14 24.2	− 6 56.1	+0.2457	0.5442	0.1029	+57	−11
17 Tauri	3.8	1.56	7.8	23 51.1	14 26.3	− 6 54.1	+0.4425	0.5442	0.1028	+71	− 1
18 Tauri	5.6	1.57	7.6	24 34.7	14 33.5	− 6 47.2	−0.3423	0.5442	0.1025	+23	−43
q Tauri	4.3	+1.56	+ 7.7	+24 12.4	14 35.1	− 6 45.6	+0.0684	0.5442	+0.1025	+46	−21
20 Tauri	4.1	1.56	7.7	24 6.5	14 52.2	− 6 29.2	+0.2058	0.5443	0.1018	+55	−14
21 Tauri	5.8	1.56	7.6	24 17.7	14 54.3	− 6 27.1	+0.0041	0.5443	0.1018	+42	−24
22 Tauri	6.5	1.56	7.6	24 16.1	14 58.2	− 6 23.3	+0.0397	0.5443	0.1016	+44	−22
23 Tauri	4.3	1.56	7.8	23 41.4	15 6.4	− 6 15.4	+0.6891	0.5444	0.1013	+90	+12
η Tauri	3.0	+1.56	+ 7.7	+23 50.9	15 38.0	− 5 44.8	+0.5682	0.5445	+0.1002	+82	+ 5

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JUNE.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1916.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
27 Tauri	3.7	+1.56	+ 7.7	+23 48.0	26 16 24.2	– 5 0.2	+0.6983	0.5448	+0.0985	+90	+14
28 Tauri	5.2	1.56	7.7	23 53.0	16 24.8	– 4 59.6	+0.6076	0.5448	0.0985	+87	+ 8
14 H. Tauri	5.3	1.56	7.3	25 19.7	16 54.4	– 4 31.0	–0.9313	0.5449	0.0975	–13	–65
36 Tauri	5.6	1.53	7.4	23 52.7	23 20.4	+ 1 41.8	+1.2453	0.5466	0.0833	+90	+56
p Tauri	5.6	1.53	6.8	26 15.9	27 2 14.6	+ 4 30.4	–1.1484	0.5472	0.0768	–34	–64
χ Tauri	5.3	+1.51	+ 6.8	+25 26.0	7 34.9	+ 9 39.7	+0.1434	0.5483	+0.0647	+51	–12
				NEW	*MOON.*						

JULY.

d^1 Cancri	5.9	+1.51	– 1.6	+18 36.1	1 23 56.1	– 1 41.7	+0.7855	0.5204	–0.1725	+90	+10
θ Cancri	5.5	1.53	2.0	18 22.7	2 4 6.3	+ 2 21.0	+0.3017	0.5185	0.1786	+60	–17
δ Cancri	4.2	1.56	2.6	18 27.8	10 47.4	+ 8 50.1	–1.0173	0.5154	0.1879	–16	–72
X Cancri (*var.*)	6.2	1.58	3.1	17 33.1	16 19.4	– 9 47.8	–1.0648	0.5130	0.1950	–19	–72
o^1 Cancri	5.1	+1.56	– 3.5	+15 38.7	17 18.9	– 8 50.1	+0.8538	0.5126	–0.1963	+90	+11
o^2 Cancri	5.7	1.56	3.4	15 54.2	17 29.2	– 8 40.0	+0.5331	0.5125	0.1965	+76	– 8
81 Cancri	6.4	1.58	4.1	15 20.0	3 1 12.6	– 1 10.3	–0.3892	0.5094	0.2056	+22	–58
π Caneri	5.6	1.60	4.3	15 17.4	2 43.9	+ 0 18.4	–0.6538	0.5088	0.2073	+ 7	–73
18 Leonis	5.8	1.67	6.3	12 11.7	19 21.3	– 7 32.7	–0.8193	0.5032	0.2234	– 2	–78
19 Leonis	6.4	+1.67	– 6.4	+11 57.3	19 55.1	– 6 59.8	–0.6807	0.5031	–0.2239	+ 6	–78
R Leonis (*var.*)	5–10	1.67	6.5	11 49.0	19 59.2	– 6 55.9	–0.5434	0.5031	0.2240	+14	–70
83 B. Leonis	5.9	1.67	7.4	9 19.8	4 0 47.9	– 2 15.3	+1.1093	0.5018	0.2279	+90	+22
43 Leonis	6.3	1.76	9.2	6 58.0	15 14.5	+11 47.1	+0.3376	0.4992	0.2375	+62	–23
155 B. Leonis	6.5	1.74	9.4	6 7.1	15 23.3	+11 55.6	+1.2384	0.4992	0.2376	+90	+32
35 Sextantis	6.1	+1.82	–10.4	+ 5 11.2	5 2 21.2	– 1 24.8	–0.3846	0.4985	–0.2429	+22	–64
p^4 Leonis	5.7	1.90	12.1	2 24.5	15 14.1	+11 6.5	–0.5150	0.4990	0.2470	+15	–74
p^5 Leonis	5.3	1.92	13.0	0 23.0	18 57.2	– 9 16.6	+0.7628	0.4995	0.2477	+90	– 2
359 B. Leonis	6.3	1.98	13.2	+ 0 35.4	6 0 7.3	– 4 15.2	–0.7420	0.5004	0.2484	+ 3	–89
388 B. Leonis	6.3	1.99	13.9	– 1 14.5	2 36.5	– 1 50.2	+0.6203	0.5009	0.2486	+82	–10
431 B. Leonis	6.2	+2.04	–14.4	– 1 58.5	8 15.5	+ 3 39.3	+0.0070	0.5024	–0.2486	+42	–42
78 B. Virginis	6.5	2.23	16.2	5 15.4	7 3 12.9	– 1 56.1	–1.1563	0.5098	0.2451	–25	–90
q Virginis	5.3	2.34	17.8	8 59.6	13 14.9	+ 7 48.1	+0.3843	0.5153	0.2408	+62	–22
370 B. Virginis	6.0	2.47	18.8	11 11.9	23 33.1	– 6 12.5	+0.2659	0.5220	0.2344	+54	–28
69 Virginis	4.9	2.70	20.1	15 32.6	8 15 33.5	+ 9 17.5	+1.1764	0.5347	0.2199	+74	+28
75 Virginis	5.6	+2.74	–19.8	–14 56.2	18 6.1	+11 45.1	–0.0140	0.5369	–0.2171	+36	–43
83 Virginis	5.6	2.83	20.0	15 45.8	23 29.5	– 7 2.2	–0.3066	0.5418	0.2106	+19	–60
85 Virginis	6.1	2.83	19.8	15 21.1	23 59.8	– 6 33.0	–0.8397	0.5422	0.2099	–10	–90
87 Virginis	5.8	2.86	20.5	17 26.7	9 0 49.1	– 5 45.3	+1.1621	0.5430	0.2089	+73	+27
89 Virginis	5.1	2.88	20.6	17 43.3	1 56.5	– 4 40.2	+1.2142	0.5441	0.2074	+72	+32
43 H. Virginis	5.5	+3.07	–19.9	–17 48.9	13 20.8	+ 6 20.6	–0.9624	0.5552	–0.1904	–20	–90
231 G. Virginis	6.4	3.08	19.9	18 12.1	14 4.2	+ 7 2.3	–0.7017	0.5559	0.1892	– 4	–90
236 G. Virginis	5.7	3.10	19.9	18 20.0	14 45.5	+ 7 42.3	–0.6956	0.5566	0.1881	– 4	–90
9 G. Libræ	6.5	3.24	19.9	20 4.6	21 42.8	– 9 35.4	–0.1703	0.5637	0.1757	+22	–52
17 G. Libræ	6.4	3.33	19.7	20 49.6	10 2 29.1	– 4 59.7	–0.2208	0.5686	0.1665	+19	–55
18 G. Libræ	6.1	+3.34	–19.7	–20 58.7	2 55.1	– 4 34.6	–0.1370	0.5690	–0.1656	+22	–50
43 B. Libræ	5.7	3.45	20.1	21 2.6	7 6.9	– 0 32.2	–0.7465	0.5734	0.1569	–11	–90
47 G. Libræ	6.1	3.49	18.9	21 42.7	10 49.0	+ 3 1.4	–0.6324	0.5772	0.1487	– 5	–88
64 G. Libræ	5.8	3.56	18.4	22 5.7	14 49.1	+ 6 52.3	–0.8189	0.5812	0.1395	–17	–90
153 B. Libræ	6.3	3.72	18.0	24 12.6	21 26.0	–10 46.5	+0.4496	0.5876	0.1233	+50	–17
169 B. Libræ	6.0	+3.73	–17.3	–22 52.1	23 15.9	– 9 0.9	–1.1235	0.5894	–0.1185	–40	–90
177 B. Libræ	6.2	3.74	17.2	22 52.9	23 52.3	– 8 26.0	–1.1816	0.5900	0.1170	–46	–90
42 Libræ	5.0	3.76	17.4	23 33.0	11 0 13.3	– 8 5.9	–0.5482	0.5903	0.1161	– 5	–80
b Scorpii	4.7	3.87	17.1	25 30.1	4 19.5	– 4 9.6	+0.9585	0.5940	0.1050	+64	+15
A Scorpii	4.6	3.88	16.8	25 4.9	5 20.4	– 3 11.1	+0.4314	0.5949	0.1023	+47	–18
31 B. Scorpii	5.4	+3.86	–16.6	–24 17.3	5 27.5	– 3 4.3	–0.3767	0.5950	–0.1019	+ 4	–66

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JULY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1916.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, *H*	*Y*	*x′*	*y′*	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
32 B. Scorpii	5.3	+3.85	−16.4	−23 44.0	11 5 28.7	− 3 3.2	−0.9359	0.5950	−0.1019	−28	−90
3 Scorpii	5.9	3.88	16.7	25 0.0	5 44.4	− 2 48.2	+0.3088	0.5952	0.1012	+39	−25
40 B. Scorpii	5.4	3.90	16.3	24 35.7	7 14.5	− 1 21.7	−0.2468	0.5965	0.0970	+10	−57
π Scorpii	3.0	3.93	16.6	25 52.7	7 19.7	− 1 16.7	+1.0311	0.5966	0.0967	+64	+21
48 B. Scorpii	4.9	3.96	16.2	25 38.2	9 2.3	+ 0 21.7	+0.6272	0.5981	0.0919	+59	− 6
50 B. Scorpii	6.4	+3.93	−15.9	−24 30.0	9 16.0	+ 0 34.7	−0.5316	0.5983	−0.0913	− 5	−79
24 G. Scorpii	6.2	3.96	15.5	24 14.5	10 45.7	+ 2 0.8	−0.9219	0.5994	0.0869	−29	−90
65 B. Scorpii	5.5	4.01	15.9	26 6.4	10 49.9	+ 2 4.8	+0.9366	0.5995	0.0868	+64	+14
41 G. Scorpii	6.3	3.99	15.0	24 12.8	12 58.6	+ 4 8.1	−1.1362	0.6012	0.0805	−45	−90
85 B. Scorpii	6.0	4.02	15.2	25 16.1	13 23.3	+ 4 31.8	−0.1137	0.6015	0.0793	+15	−49
σ Scorpii	3.1	+4.06	−14.7	−25 23.8	15 44.2	+ 6 46.9	−0.1642	0.6033	−0.0723	+12	−52
α Scorpii	1.2	4.14	14.2	26 15.0	18 46.5	+ 9 41.5	+0.4813	0.6055	0.0631	+47	−15
22 Scorpii	4.8	4.10	13.8	24 56.1	19 5.3	+ 9 59.4	−0.8484	0.6057	0.0621	−26	−90
116 B. Scorpii	6.2	4.15	14.0	26 21.6	19 30.2	+10 23.3	+0.5445	0.6060	0.0608	+51	−10
134 B. Scorpii	6.4	4.26	13.1	27 18.2	12 0 14.0	− 9 4.9	+1.2274	0.6089	0.0461	+63	+45
118 B. Ophiuchi	6.2	+4.34	−10.7	−26 24.2	8 27.4	− 1 12.8	+0.0629	0.6130	−0.0196	+19	−39
137 B. Ophiuchi	6.3	4.33	9.9	25 9.3	10 24.2	+ 0 39.0	−1.2030	0.6138	0.0132	−56	−86
36 Ophi. (*1st star*)	5.4	4.37	10.5	26 29.0	11 31.4	+ 1 43.2	+0.0974	0.6142	−0.0095	+20	−36
136 G. Ophiuchi	6.3	4.42	8.6	25 52.3	15 40.4	+ 5 41.4	−0.5164	0.6154	+0.0043	−12	−78
151 G. Ophiuchi	6.0	4.45	8.2	26 12.5	17 23.8	+ 7 20.3	−0.1724	0.6158	0.0100	+ 5	−52
4 G. Sagittarii	6.2	+4.53	− 6.5	−26 56.9	23 22.2	−10 57.1	+0.6746	0.6167	+0.0300	+59	− 4
67 B. Sagittarii	6.4	4.57	3.0	25 38.3	13 10 12.2	− 0 35.6	−0.0923	0.6161	0.0659	+15	−48
70 B. Sagittarii	6.4	4.56	2.6	24 57.3	11 13.6	+ 0 23.1	−0.6929	0.6159	0.0693	−16	−90
68 G. Sagittarii	6.2	4.63	2.1	26 41.2	13 25.9	+ 2 29.6	+1.1643	0.6154	0.0764	+63	+35
λ Sagittarii	2.9	4.59	2.0	25 28.2	13 32.2	+ 2 35.6	−0.0192	0.6154	0.0768	+20	−43
86 B. Sagittarii	6.5	+4.63	− 2.0	−26 38.2	13 52.3	+ 2 54.9	+1.1499	0.6153	+0.0779	+63	+33
24 Sagittarii	5.7	4.55	1.2	24 5.8	15 41.1	+ 4 39.0	−1.1920	0.6148	0.0837	−50	−90
26 Sagittarii	6.1	4.56	− 0.2	23 54.8	18 33.7	+ 7 24.0	−1.1174	0.6139	0.0929	−42	−90
126 B. Sagittarii	5.7	4.60	0.0	25 5.8	19 37.1	+ 8 24.7	+0.1413	0.6135	0.0962	+30	−34
154 B. Sagittarii	5.9	4.55	+ 1.4	23 16.9	23 42.1	−11 40.9	−1.2155	0.6118	0.1089	−51	−87
162 B. Sagittarii	6.4	+4.62	+ 1.5	−24 59.4	14 0 31.6	−10 53.5	+0.5459	0.6114	+0.1114	+55	−12
127 G. Sagittarii	6.4	4.62	1.8	25 3.6	1 16.8	−10 10.3	+0.6991	0.6111	0.1137	+64	− 2
172 B. Sagittarii	5.8	4.62	1.9	24 57.8	2 1.9	− 9 27.1	+0.6912	0.6107	0.1159	+64	− 3
189 B. Sagittarii	6.1	4.61	2.7	24 47.3	4 8.9	− 7 25.5	+0.7727	0.6096	0.1223	+65	+ 2
191 B. Sagittarii	6.5	4.56	2.8	23 19.4	4 21.1	− 7 13.8	−0.6354	0.6095	0.1228	− 9	−89
208 B. Sagittarii	6.1	+4.60	+ 3.5	−24 19.3	6 50.3	− 4 51.0	+0.6562	0.6081	+0.1302	+63	− 6
222 B. Sagittarii	5.5	4.54	4.2	22 33.5	8 44.6	− 3 1.6	−0.8146	0.6070	0.1356	−18	−90
49 Sagittarii	5.5	4.59	4.6	24 7.6	10 31.4	− 1 19.3	+0.9638	0.6059	0.1407	+66	+15
50 Sagittarii	5.5	4.52	4.8	21 56.6	10 51.4	− 1 0.1	−1.1237	0.6057	0.1416	−39	−90
53 Sagittarii	6.3	4.57	6.2	23 37.1	15 52.9	+ 3 48.7	+1.2604	0.6023	0.1553	+66	+44
274 B. Sagittarii	6.1	+4.57	+ 6.3	−23 37.2	15 59.5	+ 3 55.1	+1.2801	0.6022	+0.1556	+66	+48
σ Capricorni	5.5	4.39	10.4	19 22.7	15 7 5.8	− 5 35.6	−0.2328	0.5904	0.1922	+20	−56
π Capricorni	5.2	4.35	11.1	18 29.1	10 13.2	− 2 35.7	−0.4976	0.5878	0.1988	+ 7	−74
ρ Capricorni	5.0	4.34	11.2	18 5.3	10 50.0	− 2 0.3	−0.7628	0.5872	0.2001	− 8	−90
ο Capricorni	5.6	4.36	11.3	18 51.5	11 14.1	− 1 37.3	+0.0716	0.5869	0.2009	+37	−38
υ Capricorni	5.3	+4.32	+12.4	−18 25.9	15 17.0	+ 2 16.2	+0.4826	0.5834	+0.2089	+60	−16
81 B. Capricorni	6.4	4.30	13.2	18 20.6	19 1.5	+ 5 51.9	+1.1911	0.5801	0.2158	+72	+30
94 B. Capricorni	5.7	4.22	13.8	16 21.1	22 26.3	+ 9 9.0	−0.0181	0.5772	0.2216	+34	−43
29 Capricorni	5.5	4.15	15.4	15 31.0	16 5 55.3	− 7 38.9	+0.8647	0.5707	0.2331	+74	+ 5
53 B. Aquarii	6.5	4.10	15.1	13 32.8	6 2.6	− 7 31.9	−1.0479	0.5706	0.2333	−21	−90
18 Aquarii	5.5	+4.07	+15.7	−13 14.1	9 29.4	− 4 12.7	−0.5445	0.5676	+0.2379	+10	−77
137 B. Capricorni	6.2	3.97	16.6	10 57.0	16 1.8	+ 2 5.4	−1.2218	0.5623	0.2457	−33	−90
λ Capricorni	5.5	3.96	17.2	11 44.9	19 4.7	+ 5 1.8	+0.3220	0.5598	0.2488	+56	−25
96 B. Aquarii	6.5	3.92	17.6	10 42.2	22 10.1	+ 8 0.5	+0.0583	0.5574	0.2517	+42	−39
θ Aquarii	4.3	3.78	18.6	8 11.8	17 8 29.6	− 6 1.5	+0.2068	0.5498	0.2593	+52	−31
ρ *Aquarii*	5.3	+3.77	+18.8	− 8 14.3	10 0.8	− 4 33.4	+0.6433	0.5488	+0.2602	+80	− 9

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JULY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1916.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
B. Aquarii	6.0	+3.75	+18.9	- 7 36.8	**17** 11 31.7	- 3 5.7	+0.4148	0.5478	+0.2609	+65	-20
B. Aquarii	6.1	3.71	19.2	6 58.7	15 3.5	+ 0 18.9	+0.7045	0.5455	0.2625	+83	- 5
Aquarii	5.2	3.64	19.0	4 39.4	18 2.1	+ 3 11.5	-0.8405	0.5437	0.2636	- 3	-90
B. Aquarii	6.3	3.62	19.0	3 59.2	19 26.1	+ 4 32.7	-1.1444	0.5428	0.2640	-23	-90
G. Piscium	6.2	3.54	19.6	2 50.4	**18** 3 33.0	-11 36.6	-0.1517	0.5384	0.2654	+34	-50
B. Piscium	6.4	+3.41	+19.9	- 0 9.9	15 30.0	- 0 3.0	+0.3094	0.5330	+0.2646	+60	-26
Piscium	4.9	3.38	19.6	+ 0 48.1	17 7.5	+ 1 31.4	-0.2430	0.5325	0.2643	+29	-56
Piscium	6.4	3.38	19.7	0 40.0	17 16.6	+ 1 40.2	-0.0661	0.5324	0.2642	+38	-46
Piscium	5.7	3.33	19.8	1 38.5	21 39.9	+ 5 55.1	+0.0973	0.5309	0.2630	+47	-37
Piscium	4.6	3.31	19.9	1 19.4	**19** 0 23.3	+ 8 33.4	+1.1386	0.5301	0.2620	+90	+22
Piscium	5.4	+3.28	+19.6	+ 3 1.6	2 28.9	+10 34.9	-0.0566	0.5295	+0.2611	+39	-45
Piscium	5.8	3.26	19.9	2 28.1	5 10.4	-10 48.6	+1.2168	0.5288	0.2598	+90	+29
Piscium	6.2	3.13	18.7	7 46.8	17 7.7	+ 0 46.0	-1.1899	0.5266	0.2525	-26	-82
Piscium	5.4	3.12	18.8	7 43.7	19 5.6	+ 2 40.2	-0.6447	0.5263	0.2510	+ 8	-80
B. Piscium	6.5	3.02	18.5	8 54.1	**20** 5 9.3	-11 35.1	+0.6197	0.5257	0.2424	+82	- 8
Piscium	6.3	+2.92	+17.4	+12 30.7	17 30.9	+ 0 23.3	-0.2402	0.5262	+0.2294	+30	-51
Piscium	3.7	2.83	16.4	14 55.1	**21** 5 36.8	-11 53.6	-0.0961	0.5277	0.2143	+37	-42
Piscium	6.2	2.81	16.5	14 14.2	7 41.8	- 9 52.5	+1.0698	0.5280	0.2114	+90	+24
Piscium	6.1	2.80	15.9	15 59.1	9 34.1	- 8 3.8	-0.3918	0.5284	0.2088	+22	-57
Arietis	6.4	2.78	15.5	16 59.8	12 53.7	- 4 50.6	-0.7829	0.5290	0.2040	- 1	-73
Arietis	5.8	+2.77	+15.6	+16 32.5	13 40.0	- 4 5.8	-0.1420	0.5292	+0.2029	+34	-43
Arietis	5.1	2.74	15.1	17 24.7	18 4.0	+ 0 9.9	-0.1914	0.5301	0.1963	+32	-44
B. Arietis	6.4	2.72	14.9	17 51.2	21 6.7	+ 3 6.8	-0.0735	0.5308	0.1915	+38	-38
B. Arietis	6.5	2.70	14.9	17 38.0	23 3.2	+ 4 59.4	+0.5312	0.5313	0.1885	+77	- 6
Arietis	5.9	2.70	14.3	19 6.5	**22** 0 24.0	+ 6 17.7	-0.7957	0.5316	0.1863	- 2	-71
Arietis	5.6	+2.68	+14.0	+19 31.0	3 58.3	+ 9 45.1	-0.5804	0.5326	+0.1804	+11	-65
Arietis	6.2	2.63	13.8	19 29.2	9 54.0	- 8 30.8	+0.4911	0.5342	0.1702	+74	- 6
Arietis	5.4	2.61	12.8	21 36.1	13 44.3	- 4 47.9	-1.1499	0.5352	0.1633	-29	-68
Arietis	5.7	2.59	13.4	19 39.5	15 25.7	- 3 9.8	+1.2224	0.5357	0.1602	+90	+44
Arietis (*mean*)	4.6	2.53	12.5	21 0.5	23 18.1	+ 4 27.1	+0.9690	0.5379	0.1454	+90	+25
Arietis	5.8	+2.48	+10.6	+24 25.8	**23** 10 53.5	- 8 20.5	-1.1980	0.5411	+0.1222	-36	-66
Arietis	6.1	2.45	11.1	22 31.1	12 49.4	- 6 28.4	+1.1182	0.5416	0.1182	+90	+39
Tauri	5.9	2.45	10.4	24 11.2	15 33.6	- 3 49.7	-0.3857	0.5423	0.1124	+21	-46
Tauri	6.1	2.44	9.9	25 3.7	18 27.0	- 1 2.2	-1.0262	0.5431	0.1063	-20	-65
Tauri	5.4	2.41	10.0	24 1.7	20 18.6	+ 0 45.6	+0.2964	0.5435	0.1023	+60	- 9
Tauri	3.8	+2.41	+10.1	+23 51.2	20 20.7	+ 0 47.7	+0.4924	0.5435	+0.1022	+75	+ 2
Tauri	5.6	2.42	9.9	24 34.8	20 27.9	+ 0 54.7	-0.2898	0.5435	0.1020	+26	-40
Tauri	4.3	2.41	10.0	24 12.4	20 29.5	+ 0 56.3	+0.1196	0.5435	0.1019	+49	-17
Tauri	4.1	2.41	10.0	24 6.5	20 46.6	+ 1 12.7	+0.2564	0.5436	0.1013	+58	-10
Tauri	5.8	2.41	9.9	24 17.8	20 48.6	+ 1 14.7	+0.0553	0.5436	0.1012	+45	-21
Tauri	6.5	+2.41	+10.0	+24 16.2	20 52.5	+ 1 18.4	+0.0908	0.5436	+0.1011	+47	-19
Tauri	4.3	2.40	10.1	23 41.4	21 0.6	+ 1 26.3	+0.7380	0.5437	0.1008	+90	+15
Tauri	3.0	2.40	10.0	23 50.9	21 32.3	+ 1 56.9	+0.6173	0.5438	0.0996	+88	+ 8
Tauri	3.7	2.39	10.0	23 48.0	22 18.3	+ 2 41.4	+0.7467	0.5440	0.0980	+90	+16
Tauri	5.2	2.39	10.0	23 53.0	22 18.9	+ 2 42.0	+0.6563	0.5440	0.0979	+90	+11
H. Tauri	5.3	+2.41	+ 9.4	+25 19.8	22 48.5	+ 3 10.5	-0.8781	0.5441	+0.0969	- 9	-65
Tauri	5.6	2.35	8.4	26 15.9	**24** 8 8.0	-11 49.0	-1.0994	0.5460	0.0761	-27	-64
Tauri	5.3	2.31	8.3	25 26.1	13 28.2	- 6 39.6	+0.1870	0.5469	+0.0640	+53	-10
B. Aurigæ	5.7	2.12	4.8	26 52.4	**25** 23 7.2	+ 1 50.5	-0.5663	0.5478	-0.0146	+10	-49
Tauri	5.1	2.10	4.9	25 51.1	**26** 0 18.7	+ 2 59.6	+0.5469	0.5477	0.0174	+81	+13
Tauri	4.7	+2.05	+ 4.1	+25 56.7	8 36.4	+11 0.4	+0.2193	0.5465	-0.0367	+56	- 6
B. Geminorum	6.5	1.95	2.5	24 39.7	**27** 2 45.8	+ 4 33.3	+0.6061	0.5421	0.0774	+87	+11
Geminorum	3.2	1.94	2.1	25 13.0	5 45.8	+ 7 27.2	-0.2516	0.5411	0.0839	+28	-36
B. Geminorum	5.8	1.91	2.0	23 42.2	9 33.6	+11 7.6	+1.0970	0.5399	0.0920	+90	+39
Geminorum	5.7	+1.92	+ 1.6	+25 28.9	11 4.8	-11 24.3	-1.0237	0.5394	-0.0952	-20	-65

NEW MOON.

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JULY.

THE STAR'S					AT CONJUNCTION IN R. A.					Limi-ting Pa-allels	
Name.	Mag.	Red'ns from 1916.0. Δα	Red'ns from 1916.0. Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		s	″	° ′	d h m	h m				°	°
43 Leonis	6.3	+1.70	− 8.3	+ 6 58.0	31 20 58.4	− 4 41.7	+0.3362	0.5011	−0.2384	+61	
155 B. Leonis	6.5	+1.68	− 8.4	+ 6 7.1	21 7.2	− 4 33.1	+1.2327	0.5011	−0.2385	+90	
					AUGUST.						
35 Sextantis	6.1	+1.73	− 9.4	+ 5 11.2	1 8 3.7	+ 6 5.1	−0.3867	0.5000	−0.2436	+22	
p^4 Leonis	5.7	1.76	10.8	2 24.5	20 56.2	− 5 24.0	−0.5171	0.4999	0.2474	+15	
p^5 Leonis	5.3	1.78	11.4	0 23.1	2 0 39.4	− 1 46.9	+0.7647	0.5003	0.2480	+90	
359 B. Leonis	6.3	1.81	11.7	+ 0 35.4	5 50.1	+ 3 15.1	−0.7446	0.5009	0.2485	+ 3	
388 B. Leonis	6.3	1.82	12.2	− 1 14.4	8 19.8	+ 5 40.6	+0.6229	0.5013	0.2486	+82	
431 B. Leonis	6.2	+1.85	−12.8	− 1 58.5	14 0.1	+11 11.3	+0.0078	0.5023	−0.2485	+42	
78 B. Virginis	6.5	1.99	14.4	5 15.4	3 9 5.4	+ 5 43.8	−1.1606	0.5082	0.2442	−20	
q Virginis	5.3	2.07	15.9	8 59.6	19 14.1	− 8 25.3	+0.3920	0.5128	0.2395	+62	
370 B. Virginis	6.0	2.19	16.9	11 11.9	4 5 41.2	+ 1 43.0	+0.2748	0.5185	0.2326	+54	
69 Virginis	4.9	2.40	18.3	15 32.6	21 59.5	− 6 29.0	+1.1984	0.5295	0.2176	+74	
75 Virginis	5.6	+2.43	−18.1	−14 56.2	5 0 35.4	− 3 58.1	−0.0050	0.5314	−0.2147	+36	
83 Virginis	5.6	2.52	18.3	15 45.7	6 6.1	+ 1 21.9	−0.3003	0.5357	0.2081	+30	
85 Virginis	6.1	2.53	18.2	15 21.1	6 37.1	+ 1 51.9	−0.8399	0.5361	0.2074	−10	
87 Virginis	5.8	2.55	18.8	17 26.7	7 27.6	+ 2 40.7	+1.1867	0.5368	0.2063	+73	
89 Virginis	5.1	2.56	18.9	17 43.3	8 36.7	+ 3 47.6	+1.2396	0.5378	0.2048	+73	
43 H. Virginis	5.5	+2.75	−18.4	−17 48.9	20 18.8	− 8 53.9	−0.9638	0.5477	−0.1877	−19	
231 G. Virginis	6.4	2.77	18.5	18 12.0	21 3.3	− 8 10.9	−0.6993	0.5484	0.1865	− 4	
236 G. Virginis	5.7	2.78	18.5	18 19.9	21 45.8	− 7 29.8	−0.6933	0.5490	0.1854	− 4	
9 G. Libræ	6.5	2.92	18.7	20 4.6	6 4 55.2	− 0 35.4	−0.1602	0.5554	0.1730	+23	
17 G. Libræ	6.4	3.01	18.6	20 49.5	9 50.1	+ 4 9.0	−0.2110	0.5598	0.1638	+19	
18 G. Libræ	6.1	+3.02	−18.6	−20 58.7	10 16.9	+ 4 34.9	−0.1257	0.5602	−0.1630	+23	
43 B. Libræ	5.7	3.14	19.2	21 2.6	14 36.5	+ 8 45.1	−0.7439	0.5642	0.1543	−10	
47 G. Libræ	6.1	3.18	18.1	21 42.6	18 25.8	−11 34.1	−0.6282	0.5677	0.1463	− 5	
64 G. Libræ	5.8	3.26	17.7	22 5.6	22 33.7	− 7 35.4	−0.8174	0.5714	0.1371	−17	
153 B. Libræ	6.3	3.42	17.6	24 12.6	7 5 23.7	− 1 0.9	+0.4712	0.5775	0.1210	+51	
169 B. Libræ	6.0	+3.44	−16.8	−22 52.1	7 17.4	+ 0 48.4	−1.1265	0.5791	−0.1164	−40	
177 B. Libræ	6.2	3.45	16.7	22 52.8	7 54.9	+ 1 24.4	−1.1856	0.5797	0.1149	−47	
42 Libræ	5.0	3.47	16.9	23 33.0	8 16.7	+ 1 45.4	−0.5421	0.5800	0.1140	− 4	
b Scorpii	4.7	3.59	16.9	25 30.1	12 31.3	+ 5 50.1	+0.9884	0.5835	0.1032	+64	+17
A Scorpii	4.6	3.60	16.6	25 4.9	13 34.2	+ 6 50.5	+0.4531	0.5844	0.1004	+48	−17
31 B. Scorpii	5.4	+3.59	−16.3	−24 17.3	13 41.6	+ 6 57.6	−0.3678	0.5845	−0.1001	+ 4	
32 B. Scorpii	5.3	3.58	16.1	23 44.0	13 42.8	+ 6 58.8	−0.9358	0.5845	0.1001	−28	
3 Scorpii	5.9	3.61	16.5	25 0.0	13 59.1	+ 7 14.4	+0.3285	0.5847	0.0993	+41	
40 B. Scorpii	5.4	3.63	16.0	24 35.7	15 32.2	+ 8 43.9	−0.2359	0.5860	0.0952	+10	
π Scorpii	3.0	3.66	16.5	25 52.7	15 37.6	+ 8 49.1	+1.0623	0.5860	0.0950	+64	
48 B. Scorpii	4.9	+3.68	−16.1	−25 38.2	17 23.7	+10 31.0	+0.6521	0.5874	−0.0902	+81	
50 B. Scorpii	6.4	3.67	15.7	24 30.0	17 37.9	+10 44.6	−0.5250	0.5876	0.0896	− 5	
24 G. Scorpii	6.2	3.70	15.3	24 14.5	19 10.7	−11 46.4	−0.9215	0.5888	0.0854	−28	
65 B. Scorpii	5.5	3.74	15.9	26 6.4	19 15.1	−11 42.1	+0.9663	0.5888	0.0852	+64	+16
41 G. Scorpii	6.3	3.74	14.8	24 12.7	21 28.2	− 9 34.4	−1.1392	0.5905	0.0790	−46	
85 B. Scorpii	6.0	+3.77	−15.1	−25 16.1	21 53.7	− 9 9.9	−0.1005	0.5908	−0.0779	+16	−48
σ Scorpii	3.1	3.82	14.7	25 23.8	8 0 19.5	− 6 49.9	−0.1518	0.5925	0.0710	+13	−51
α Scorpii	1.2	3.90	14.3	26 15.0	3 28.0	− 3 49.1	+0.5036	0.5947	0.0619	+48	−14
22 Scorpii	4.8	3.87	13.8	24 56.1	3 47.5	− 3 30.5	−0.8468	0.5949	0.0610	−26	
116 B. Scorpii	6.2	3.92	14.2	26 21.6	4 13.2	− 3 5.8	+0.5679	0.5952	0.0597	+53	−19
134 B. Scorpii	6.4	+4.03	−13.4	−27 18.2	9 6.7	+ 1 35.7	+1.2611	0.5982	−0.0453	+63	+51
118 B. Ophiuchi	6.2	4.16	11.1	26 24.2	17 36.5	+ 9 44.3	+0.0782	0.6025	0.0193	+20	
137 B. Ophiuchi	6.3	4.16	10.2	25 9.3	19 37.1	+11 39.8	−1.2066	0.6034	0.0130	−57	−86
36 Ophi. (*1st star*)	5.4	4.21	11.0	26 29.0	20 46.5	−11 13.7	+0.1131	0.6038	−0.0094	+21	
136 G. Ophiuchi	6.3	4.27	9.0	25 52.3	9 1 3.5	− 7 7.5	−0.5100	0.6053	+0.0041	−11	−77
151 G. Ophiuchi	6.0	+4.31	− 8.6	−26 12.5	2 50.0	− 5 25.5	−0.1612	0.6057	+0.0098	+ 7	

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

AUGUST.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1916.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	"	° ′	d h m	h m				°	°
G. Sagittarii	6.2	+4.44	− 7.2	−26 56.9	9 8 59.4	+ 0 28.2	+0.6968	0.6070	+0.0294	+61	− 2
B. Sagittarii	6.4	4.54	3.6	25 38.3	20 7.7	+11 8.0	−0.0819	0.6075	0.0649	+15	−47
B. Sagittarii	6.4	4.53	3.0	24 57.3	21 10.8	−11 51.5	−0.6900	0.6074	0.0681	−16	−90
G. Sagittarii	6.2	4.62	2.8	26 41.2	23 26.5	− 9 41.6	+1.1888	0.6072	0.0752	+63	+38
Sagittarii	2.9	4.57	2.6	25 28.2	23 33.0	− 9 35.4	−0.0085	0.6071	0.0756	+20	−43
B. Sagittarii	6.5	+4.62	− 2.7	−26 38.2	23 53.6	− 9 15.7	+1.1742	0.6071	+0.0766	+63	+36
Sagittarii	5.7	4.55	1.5	24 5.8	10 1 45.1	− 7 28.9	−1.1948	0.6068	0.0824	−51	−89
Sagittarii	6.1	4.57	0.6	23 54.8	4 41.8	− 4 39.7	−1.1194	0.6063	0.0915	−43	−90
B. Sagittarii	5.7	4.63	− 0.5	25 5.8	5 46.8	− 3 37.6	+0.1527	0.6060	0.0948	+30	−34
B. Sagittarii	5.9	4.61	+ 1.1	23 16.9	9 57.2	+ 0 22.3	−1.2186	0.6049	0.1074	−51	−87
B. Sagittarii	6.4	+4.67	+ 1.0	−24 59.4	10 47.8	+ 1 10.8	+0.5602	0.6046	+0.1099	+56	−11
G. Sagittarii	6.4	4.68	1.3	25 3.6	11 34.0	+ 1 55.1	+0.7145	0.6043	0.1122	+65	− 2
B. Sagittarii	5.8	4.68	1.4	24 57.8	12 20.1	+ 2 39.2	+0.7063	0.6041	0.1144	+65	− 2
B. Sagittarii	6.1	4.70	2.2	24 47.3	14 29.6	+ 4 43.3	+0.7878	0.6032	0.1207	+65	+ 3
B. Sagittarii	6.5	4.64	2.6	23 19.4	14 42.1	+ 4 55.3	−0.6333	0.6031	0.1214	− 9	−89
B. Sagittarii	6.1	+4.70	+ 3.1	−24 19.3	17 14.1	+ 7 20.9	+0.6692	0.6022	+0.1287	+64	− 5
B. Sagittarii	5.5	4.64	4.1	22 33.5	19 10.5	+ 9 12.4	−0.8145	0.6013	0.1341	−17	−90
Sagittarii	5.5	4.72	4.3	24 7.6	20 59.2	+10 56.6	+0.9780	0.6005	0.1392	+66	+16
Sagittarii	5.5	4.64	4.8	21 56.6	21 19.5	+11 16.1	−1.1263	0.6002	0.1401	−38	−90
Sagittarii	6.3	4.73	6.0	23 37.1	11 2 25.9	− 7 50.1	+1.2741	0.5977	0.1539	+66	+47
B. Sagittarii	6.1	+4.73	+ 6.1	−23 37.2	2 32.6	− 7 43.7	+1.2939	0.5976	+0.1541	+66	+51
Capricorni	5.5	4.64	11.0	19 22.7	17 48.9	+ 6 55.7	−0.2336	0.5882	0.1911	+20	−56
Capricorni	5.2	4.61	12.0	18 29.1	20 57.7	+ 9 57.0	−0.5001	0.5861	0.1979	+ 6	−74
Capricorni	5.0	4.60	12.1	18 5.3	21 34.7	+10 32.6	−0.7665	0.5857	0.1992	− 9	−90
Capricorni	5.6	4.63	12.1	18 51.5	21 58.9	+10 55.8	+0.0705	0.5854	0.2000	+36	−39
Capricorni	5.3	+4.62	+13.3	−18 25.9	12 2 2.9	− 9 9.7	+0.4807	0.5826	+0.2082	+60	−16
B. Capricorni	6.4	4.62	14.2	18 20.5	5 48.0	− 5 33.3	+1.1883	0.5799	0.2153	+72	+30
B. Capricorni	5.7	4.56	15.2	16 21.1	9 12.9	− 2 16.3	−0.0238	0.5775	0.2214	+34	−44
Capricorni	5.5	4.52	16.9	15 31.0	16 41.2	+ 4 55.1	+0.8551	0.5722	0.2333	+74	+ 4
B. Aquarii	6.5	4.47	17.0	13 32.8	16 48.5	+ 5 2.2	−1.0560	0.5721	0.2335	−22	−90
Aquarii	5.5	+4.46	+17.8	−13 14.1	20 14.4	+ 8 20.4	−0.5542	0.5697	+0.2383	+ 9	−78
B. Capricorni	6.2	4.39	19.1	10 57.0	13 2 44.2	− 9 24.0	−1.2317	0.5652	0.2465	−35	−90
Capricorni	5.5	4.40	19.6	11 44.9	5 45.5	− 6 29.3	+0.3059	0.5631	0.2499	+55	−26
B. Aquarii	6.5	4.36	20.2	10 42.1	8 49.0	− 3 32.4	+0.0416	0.5611	0.2529	+42	−40
Aquarii	4.3	4.28	21.7	8 11.8	19 0.5	+ 6 17.5	+0.1840	0.5548	0.2612	+50	−32
Aquarii	5.3	+4.27	+22.0	− 8 14.2	20 30.3	+ 7 44.2	+0.6169	0.5540	+0.2621	+78	−10
B. Aquarii	6.0	4.26	22.2	7 36.8	21 59.7	+ 9 10.5	+0.3889	0.5532	0.2630	+63	−22
B. Aquarii	6.1	4.24	22.5	6 58.7	14 1 27.9	−11 28.6	+0.6746	0.5512	0.2648	+82	− 7
Aquarii	5.2	4.18	22.7	4 39.3	4 23.3	− 8 39.2	−0.8604	0.5497	0.2660	− 5	−90
B. Aquarii	6.3	4.16	22.8	3 59.1	5 45.7	− 7 19.6	−1.1625	0.5490	0.2664	−25	−90
G. Piscium	6.2	+4.11	+23.6	− 2 50.3	13 42.8	+ 0 21.4	−0.1816	0.5452	+0.2683	+32	−52
B. Piscium	6.4	4.02	24.3	− 0 9.8	15 1 23.2	+11 38.4	+0.2689	0.5408	0.2680	+57	−28
Piscium	4.9	4.01	24.2	+ 0 48.1	2 58.3	−10 49.6	−0.2785	0.5403	0.2677	+28	−58
Piscium	6.4	4.01	24.3	0 40.1	3 7.1	−10 41.1	−0.1034	0.5402	0.2676	+37	−48
Piscium	5.7	3.97	24.4	1 38.6	7 23.8	− 6 32.9	+0.0560	0.5390	0.2664	+45	−39
Piscium	4.6	+3.96	+24.5	+ 1 19.5	10 3.0	− 3 58.9	+1.0842	0.5382	+0.2655	+90	+18
Piscium	5.4	3.94	24.4	3 1.7	12 5.2	− 2 0.7	−0.0985	0.5377	0.2647	+37	−47
Piscium	5.8	3.93	24.7	2 28.2	14 42.4	+ 0 31.4	+1.1587	0.5371	0.2634	+90	+24
Piscium	6.2	3.84	23.9	7 46.8	16 2 19.8	+11 46.1	−1.2243	0.5352	0.2562	−30	−82
Piscium	5.4	3.83	24.0	7 43.8	4 14.3	−10 23.1	−0.6866	0.5350	0.2547	+ 6	−82
B. Piscium	6.5	+3.77	+23.7	+ 8 54.2	14 0.8	− 0 55.6	+0.5576	0.5344	+0.2460	+77	−11
Piscium	6.3	3.71	22.6	12 30.7	17 2 1.4	+10 41.6	−0.2957	0.5345	0.2327	+26	−54
Piscium	3.7	3.65	21.5	14 55.2	13 47.2	− 1 55.4	−0.1573	0.5356	0.2172	+34	−45
Piscium	6.2	3.63	21.6	14 14.3	15 48.9	+ 0 2.3	+0.9933	0.5358	0.2142	+90	+18
Piscium	6.1	3.63	21.0	15 59.2	17 38.2	+ 1 48.0	−0.4504	0.5361	0.2116	+18	−61
Arietis	6.4	+3.62	+20.5	+16 59.9	20 52.6	+ 4 56.0	−0.8375	0.5366	+0.2066	− 4	−73

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

AUGUST.

The Star's						At Conjunction in R. A.					Limiting Parallels.	
Name.		Mag.	Red'ns from 1916.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x′	y′	N.	S.
			Δα	Δδ								
			s	″	° ′	d h m	h m				°	°
4	Arietis	5.8	+3.62	+20.6	+16 32.6	17 21 37.6	+ 5 39.6	−0.2048	0.5366	+0.2055	+31	−46
ι	Arietis	5.1	3.59	20.1	17 24.8	18 1 55.0	+ 9 48.6	−0.2548	0.5374	0.1987	+28	−45
35 B.	Arietis	6.4	3.58	19.8	17 51.3	4 53.2	−11 19.1	−0.1389	0.5379	0.1938	+34	−41
47 B.	Arietis	6.5	3.56	19.7	17 38.1	6 46.8	− 9 29.2	+0.4583	0.5382	0.1907	+71	−10
15	Arietis	5.9	3.57	19.1	19 6.6	8 5.7	− 8 12.9	−0.8533	0.5384	0.1884	− 5	−71
θ	Arietis	5.6	+3.55	+18.7	+19 31.1	11 35.0	− 4 50.5	−0.6413	0.5391	+0.1824	+ 7	−68
26	Arietis	6.2	3.51	18.2	19 29.3	17 22.7	+ 0 45.7	+0.4171	0.5402	0.1719	+68	−10
ν	Arietis	5.4	3.51	17.2	21 36.2	21 8.1	+ 4 23.6	−1.2064	0.5410	0.1649	−34	−68
μ	Arietis	5.7	3.48	17.7	19 39.6	22 47.4	+ 5 59.5	+1.1402	0.5414	0.1618	+90	+36
ε	Arietis (*mean*)	4.6	3.44	16.5	21 0.6	19 6 30.6	−10 32.9	+0.8894	0.5429	0.1466	+90	+20
64	Arietis	5.8	+3.40	+14.0	+24 25.9	17 54.0	+ 0 27.5	−1.2578	0.5451	+0.1230	−45	−66
66	Arietis	6.1	3.36	14.4	22 31.2	19 48.2	+ 2 17.9	+1.0379	0.5454	0.1190	+90	+32
7	Tauri	5.9	3.37	13.6	24 11.2	22 29.9	+ 4 54.1	−0.4530	0.5459	0.1132	+17	−50
11	Tauri	6.1	3.36	13.0	25 3.7	20 1 20.8	+ 7 39.2	−1.0883	0.5463	0.1069	−25	−65
16	Tauri	5.4	3.33	13.1	24 1.8	3 10.9	+ 9 25.5	+0.2236	0.5467	0.1029	+56	−13
17	Tauri	3.8	+3.32	+13.1	+23 51.2	3 13.0	+ 9 27.6	+0.4180	0.5467	+0.1028	+70	− 3
18	Tauri	5.6	3.34	12.9	24 34.8	3 20.2	+ 9 34.5	−0.3580	0.5467	0.1026	+22	−43
q	Tauri	4.3	3.33	13.0	24 12.5	3 21.7	+ 9 36.0	+0.0482	0.5467	0.1025	+45	−21
20	Tauri	4.1	3.33	13.0	24 6.6	3 38.6	+ 9 52.3	+0.1839	0.5467	0.1019	+53	−14
21	Tauri	5.8	3.33	12.9	24 17.8	3 40.6	+ 9 54.2	−0.0156	0.5467	0.1018	+41	−24
22	Tauri	6.5	+3.33	+12.9	+24 16.2	3 44.4	+ 9 57.9	+0.0196	0.5468	+0.1016	+43	−23
23	Tauri	4.3	3.32	13.1	23 41.5	3 52.5	+10 5.7	+0.6616	0.5468	0.1013	+90	+11
η	Tauri	3.0	3.32	13.0	23 51.0	4 23.7	+10 35.9	+0.5419	0.5468	0.1002	+80	+ 4
27	Tauri	3.7	3.31	12.9	23 48.1	5 9.1	+11 19.7	+0.6704	0.5470	0.0985	+90	+11
28	Tauri	5.2	3.31	12.9	23 53.1	5 9.7	+11 20.3	+0.5808	0.5470	0.0985	+84	+ 7
14 H.	Tauri	5.3	+3.33	+12.3	+25 19.8	5 38.9	+11 48.5	−0.9416	0.5470	+0.0974	−14	−65
36	Tauri	5.6	3.25	12.1	23 52.7	11 59.7	− 6 3.7	+1.2102	0.5478	0.0831	+87	+51
p	Tauri	5.6	3.27	10.8	26 15.9	14 52.0	− 3 17.4	−1.1616	0.5481	0.0765	−34	−64
χ	Tauri	5.3	3.22	10.4	25 26.1	20 9.2	+ 1 49.0	+0.1164	0.5486	+0.0643	+49	−14
112 B.	Aurigæ	5.7	2.95	5.3	26 52.4	22 5 37.1	+10 7.9	−0.6270	0.5473	−0.0143	+ 6	−54
125	Tauri	5.1	+2.92	+ 5.4	+25 51.2	6 48.5	+11 16.8	+0.4822	0.5472	−0.0171	+75	+ 9
139	Tauri	4.7	2.85	4.3	25 56.7	15 5.3	− 4 43.2	+0.1585	0.5456	0.0363	+52	− 9
52 B.	Geminorum	6.5	2.66	2.1	24 39.7	23 9 14.2	−11 10.8	+0.5514	0.5409	0.0768	+81	+ 7
ε	Geminorum	3.2	2.65	1.5	25 12.9	12 14.3	− 8 16.7	−0.3028	0.5400	0.0833	+25	−39
87 B.	Geminorum	5.8	2.59	1.5	23 42.1	16 2.2	− 4 36.3	+1.0445	0.5387	0.0913	+90	+38
37	Geminorum	5.7	+2.61	+ 0.7	+25 28.9	17 33.4	− 3 8.1	−1.0709	0.5382	−0.0944	−24	−65
ω	Geminorum	5.2	2.56	+ 0.6	24 20.2	20 55.0	+ 0 6.9	−0.1289	0.5370	0.1013	+36	−31
48	Geminorum	5.8	2.52	− 0.1	24 16.2	24 1 39.8	+ 4 42.4	−0.5594	0.5352	0.1109	+11	−57
58	Geminorum	6.0	2.46	0.4	23 6.5	6 56.5	+ 9 48.8	+0.1177	0.5332	0.1213	+49	−20
	B. D.+23° 1744	6.4	2.42	1.0	23 4.0	11 26.8	− 9 49.4	−0.4031	0.5315	0.1298	+20	−49
187 B.	Geminorum	6.3	+2.40	− 1.5	+23 12.8	15 22.7	− 6 1.1	−1.0898	0.5300	−0.1370	−24	−67
192 B.	Geminorum	6.3	2.38	1.5	22 35.9	16 33.1	− 4 52.9	−0.5689	0.5294	0.1392	+10	−60
	SATURN	0.4	. . .	. . .	20 59.8	22 11.3	+ 0 34.6	+0.3942	0.5222	0.1484	+67	− 9
85	Geminorum	5.2	2.30	1.7	20 6.4	22 35.9	+ 0 58.5	+1.3212	0.5270	0.1498	+68	+63
217 B.	Geminorum	6.3	2.28	2.0	20 2.8	25 1 7.4	+ 3 25.4	+1.0029	0.5260	0.1541	+90	+26
d^1	Cancri	5.9	+2.18	− 3.1	+18 36.1	12 22.4	− 9 40.6	+0.7658	0.5215	−0.1723	+90	+ 8
	NEPTUNE	7.8	. . .	. . .	19 8.2	14 36.9	− 7 30.1	−0.2164	0.5192	0.1753	+30	−44
θ	Cancri	5.5	2.15	3.6	18 22.7	16 31.3	− 5 39.1	+0.2856	0.5199	0.1785	+59	−18
δ	Cancri	4.2	2.12	4.5	18 27.8	23 10.0	+ 0 47.6	−1.0254	0.5174	0.1879	−17	−72
X	Cancri (*var.*)	6.2	2.08	4.7	+17 33.0	26 4 39.7	+ 6 7.4	−1.0689	0.5154	0.1952	−20	−71
					NEW	*MOON.*						
78 B.	Virginis	6.5	+1.85	−13.1	− 5 15.3	30 14 36.8	−10 57.4	−1.0618	0.5117	−0.2449	−23	−90
q	Virginis	5.3	1.90	14.2	8 59.6	31 0 41.3	− 1 10.9	+0.4978	0.5158	0.2400	+69	−16
370 B.	Virginis	6.0	+1.97	−15.0	−11 11.8	11 5.1	+ 8 54.2	+0.3890	0.5210	−0.2329	+61	−22

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

SEPTEMBER.

The Star's					At Conjunction in R. A.						Limiting Parallels.	
Name.	Mag.	Red'ns from 1916.0.		Apparent Declination.	Greenwich Mean Time.		Hour Angle, H	Y	x'	y'	N.	S.
		Δα	Δδ									
		s	″	° ′	d	h m	h m				°	°
69 Virginis	4.9	+2.12	−16.3	−15 32.6	1	3 21.6	+ 0 40.6	+1.3262	0.5307	−0.2174	+74	+46
75 Virginis	5.6	2.15	16.2	14 56.1		5 57.7	+ 3 11.6	+0.1215	0.5324	0.2144	+43	−36
83 Virginis	5.6	2.22	16.3	15 45.7		11 29.1	+ 8 32.3	−0.1719	0.5362	0.2076	+27	−52
85 Virginis	6.1	2.22	16.2	15 21.0		12 0.2	+ 9 2.4	−0.7131	0.5366	0.2069	− 2	−90
87 Virginis	5.8	2.24	16.8	17 26.7		12 50.9	+ 9 51.4	+1.3209	0.5371	0.2058	+73	+47
43 H. Virginis	5.5	+2.40	−16.6	−17 48.8	2	1 46.5	− 1 38.8	−0.8334	0.5466	−0.1867	−12	−90
231 G. Virginis	6.4	2.42	16.6	18 12.0		2 31.3	− 0 55.6	−0.5675	0.5472	0.1856	+ 4	−80
236 G. Virginis	5.7	2.43	16.7	18 19.9		3 14.1	− 0 14.2	−0.5611	0.5478	0.1844	+ 4	−79
9 G. Libræ	6.5	2.55	16.9	20 4.6		10 27.8	+ 6 44.4	−0.0232	0.5533	0.1719	+30	−43
17 G. Libræ	6.4	2.63	17.0	20 49.5		15 26.2	+11 32.4	−0.0734	0.5572	0.1626	+26	−46
18 G. Libræ	6.1	+2.64	−16.9	−20 58.7		15 53.4	+11 58.7	+0.0125	0.5575	−0.1618	+30	−42
43 B. Libræ	5.7	2.76	17.8	21 2.6		20 16.6	− 7 47.5	−0.6100	0.5609	0.1530	− 3	−85
47 G. Libræ	6.1	2.78	16.6	21 42.6	3	0 9.4	− 4 3.1	−0.4931	0.5640	0.1450	+ 2	−75
64 G. Libræ	5.8	2.86	16.2	22 5.6		4 21.5	− 0 0.3	−0.6840	0.5671	0.1358	− 9	−90
153 B. Libræ	6.3	3.01	16.2	24 12.6		11 19.3	+ 6 42.1	+0.6168	0.5723	0.1198	+61	− 7
169 B. Libræ	6.0	+3.02	−15.6	−22 52.1		13 15.4	+ 8 33.8	−0.9973	0.5737	−0.1152	−31	−90
177 B. Libræ	6.2	3.03	15.5	22 52.8		13 53.7	+ 9 10.6	−1.0572	0.5742	0.1136	−35	−90
42 Libræ	5.0	3.05	15.7	23 33.0		14 15.9	+ 9 31.9	−0.4071	0.5744	0.1128	+ 3	−68
b Scorpii	4.7	3.16	15.8	25 30.1		18 36.2	−10 17.6	+1.1400	0.5775	0.1020	+64	+31
A Scorpii	4.6	3.18	15.5	25 4.9		19 40.6	− 9 15.7	+0.5986	0.5782	0.0993	+58	− 8
31 B. Scorpii	5.4	+3.17	−15.2	−24 17.3		19 48.1	− 9 8.4	−0.2316	0.5783	−0.0990	+12	−56
32 B. Scorpii	5.3	3.16	15.0	23 44.0		19 49.4	− 9 7.2	−0.8060	0.5783	0.0989	−20	−90
3 Scorpii	5.9	3.18	15.4	25 0.0		20 6.0	− 8 51.3	+0.4726	0.5785	0.0982	+50	−16
40 B. Scorpii	5.4	3.21	15.0	24 35.6		21 41.3	− 7 19.5	−0.0984	0.5795	0.0941	+17	−48
π Scorpii	3.0	3.23	15.5	25 52.7		21 46.8	− 7 14.3	+1.2147	0.5796	0.0940	+64	+41
48 B. Scorpii	4.9	+3.26	−15.2	−25 38.2		23 35.5	− 5 29.8	+0.7996	0.5807	−0.0892	+64	+ 4
50 B. Scorpii	6.4	3.25	14.7	24 30.0		23 50.0	− 5 15.9	−0.3913	0.5809	0.0886	+ 2	−67
24 G. Scorpii	6.2	3.27	14.4	24 14.5	4	1 25.2	− 3 44.4	−0.7930	0.5819	0.0844	−21	−90
65 B. Scorpii	5.5	3.31	15.0	26 6.4		1 29.6	− 3 40.2	+1.1175	0.5820	0.0842	+64	+29
41 G. Scorpii	6.3	3.31	14.0	24 12.7		3 46.1	− 1 29.0	−1.0139	0.5834	0.0781	−35	−90
85 B. Scorpii	6.0	+3.34	−14.3	−25 16.1		4 12.3	− 1 3.8	+0.0375	0.5836	−0.0770	+23	−40
σ Scorpii	3.1	3.39	14.0	25 23.8		6 41.9	+ 1 20.0	−0.0150	0.5850	0.0702	+20	−43
α Scorpii	1.2	3.47	13.7	26 15.0		9 55.6	+ 4 25.9	+0.6482	0.5868	0.0613	+59	− 5
22 Scorpii	4.8	3.45	13.2	24 56.1		10 15.6	+ 4 45.2	−0.7198	0.5870	0.0603	−18	−90
116 B. Scorpii	6.2	3.49	13.6	26 21.6		10 42.0	+ 5 10.6	+0.7131	0.5872	0.0591	+63	− 1
88 B. Ophiuchi	6.3	+3.67	−11.0	−24 58.1		21 50.3	− 8 7.9	−1.1882	0.5923	−0.0271	−54	−89
118 B. Ophiuchi	6.2	3.76	10.9	26 24.2	5	0 29.1	− 5 35.5	+0.2129	0.5933	0.0193	+27	−30
137 B. Ophiuchi	6.3	3.76	10.1	25 9.3		2 33.5	− 3 36.2	−1.0912	0.5939	0.0131	−47	−90
36 Ophi. (*1st star*)	5.4	3.79	11.0	26 29.0		3 45.2	− 2 27.4	+0.2471	0.5943	−0.0096	+28	−28
136 G. Ophiuchi	6.3	3.89	9.0	25 52.3		8 10.5	+ 1 47.0	−0.3871	0.5954	+0.0036	− 5	−67
151 G. Ophiuchi	6.0	+3.93	− 8.7	−26 12.5		10 0.5	+ 3 32.5	−0.0340	0.5958	+0.0092	+13	−44
4 G. Sagittarii	6.2	4.06	7.5	26 56.9		16 22.2	+ 9 38.6	+0.8339	0.5968	0.0284	+63	+ 7
63 Ophiuchi	6.1	4.04	6.1	24 52.4		18 51.1	−11 58.6	−1.1854	0.5970	0.0359	−54	−89
67 B. Sagittarii	6.4	4.21	4.1	25 38.3	6	3 53.6	− 3 18.4	+0.0365	0.5969	0.0631	+22	−40
70 B. Sagittarii	6.4	4.20	3.5	24 57.3		4 58.9	− 2 15.7	−0.5817	0.5968	0.0663	−10	−84
λ Sagittarii	2.9	+4.26	− 3.2	−25 28.2		7 26.1	+ 0 5.4	+0.1088	0.5965	+0.0735	+26	−36
24 Sagittarii	5.7	4.24	2.0	24 5.8		9 42.8	+ 2 16.6	−1.0980	0.5962	0.0802	−42	−90
26 Sagittarii	6.1	4.28	1.1	23 54.8		12 45.7	+ 5 12.0	−1.0235	0.5956	0.0891	−35	−90
126 B. Sagittarii	5.7	4.34	− 1.2	25 5.8		13 52.9	+ 6 16.5	+0.2678	0.5953	0.0923	+36	−27
154 B. Sagittarii	5.9	4.33	+ 0.6	23 16.9		18 12.1	+10 25.1	−1.1284	0.5943	0.1047	−42	−90
162 B. Sagittarii	6.4	+4.40	+ 0.3	−24 59.4		19 4.4	+11 15.2	+0.6776	0.5940	+0.1071	+63	− 4
127 G. Sagittarii	6.4	4.42	0.5	25 3.6		19 52.2	−11 58.8	+0.8337	0.5938	0.1093	+65	+ 6
172 B. Sagittarii	5.8	4.42	0.6	24 57.8		20 39.9	−11 13.1	+0.8247	0.5935	0.1116	+65	+ 6
189 B. Sagittarii	6.1	4.44	1.4	24 47.3		22 53.9	− 9 4.5	+0.9055	0.5928	0.1177	+65	+11
191 B. Sagittarii	6.5	4.40	1.9	23 19.4		23 6.7	− 8 52.2	−0.5379	0.5927	0.1183	− 3	−79
208 B. Sagittarii	6.1	+4.47	+ 2.3	−24 19.4	7	1 44.0	− 6 21.3	+0.7826	0.5918	+0.1254	+66	+ 2

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

SEPTEMBER.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1916.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
222 B. Sagittarii	5.5	+4.42	+ 3.5	−22 33.5	7 3 44.3	− 4 25.9	−0.7259	0.5911	+0.1309	−12	−90
49 Sagittarii	5.5	4.50	3.5	24 7.6	5 36.7	− 2 38.0	+1.0923	0.5903	0.1358	+66	+25
50 Sagittarii	5.5	4.43	4.3	21 56.6	5 57.7	− 2 17.8	−1.0445	0.5901	0.1367	−32	−90
253 B. Sagittarii	6.1	4.43	4.9	21 29.2	7 45.6	− 0 34.2	−1.2500	0.5894	0.1414	−51	−84
σ Capricorni	5.5	4.54	10.6	19 22.7	8 3 5.6	− 5 59.6	−0.1606	0.5798	0.1871	+23	−51
π Capricorni	5.2	+4.53	+11.7	−18 29.1	6 19.7	− 2 53.0	−0.4347	0.5780	+0.1938	+10	−69
ρ Capricorni	5.0	4.52	11.9	18 5.3	6 57.8	− 2 16.3	−0.7052	0.5776	0.1951	− 5	−90
o Capricorni	5.6	4.55	11.8	18 51.5	7 22.6	− 1 52.5	+0.1421	0.5773	0.1959	+40	−34
υ Capricorni	5.3	4.56	13.0	18 25.9	11 33.2	+ 2 8.7	+0.5521	0.5750	0.2041	+64	−12
81 B. Capricorni	6.4	4.58	13.9	18 20.6	15 24.1	+ 5 50.8	+1.2626	0.5727	0.2112	+72	+39
94 B. Capricorni	5.7	+4.54	+15.2	−16 21.1	18 54.0	+ 9 12.9	+0.0311	0.5708	+0.2173	+37	−40
29 Capricorni	5.5	4.55	17.0	15 31.0	9 2 32.2	− 7 25.8	+0.9078	0.5664	0.2294	+74	+ 8
53 B. Aquarii	6.5	4.50	17.4	13 32.8	2 39.6	− 7 18.7	−1.0230	0.5663	0.2296	−20	−90
18 Aquarii	5.5	4.51	18.2	13 14.1	6 9.7	− 3 56.2	−0.5210	0.5644	0.2345	+10	−75
137 B. Capricorni	6.2	4.47	19.9	10 57.0	12 46.4	+ 2 26.3	−1.2143	0.5608	0.2430	−33	−90
λ Capricorni	5.5	+4.50	+20.4	−11 44.9	15 50.6	+ 5 23.9	+0.3314	0.5592	+0.2464	+57	−25
96 B. Aquarii	6.5	4.48	21.1	10 42.1	18 56.8	+ 8 23.5	+0.0598	0.5576	0.2497	+42	−39
θ Aquarii	4.3	4.45	23.1	8 11.7	10 5 15.3	− 5 39.6	+0.1852	0.5528	0.2585	+51	−32
ρ Aquarii	5.3	4.45	23.3	8 14.2	6 45.9	− 4 12.2	+0.6178	0.5521	0.2595	+78	−10
170 B. Aquarii	6.0	4.44	23.6	7 36.8	8 16.0	− 2 45.1	+0.3859	0.5516	0.2605	+63	−22
186 B. Aquarii	6.1	+4.44	+24.1	− 6 58.7	11 45.7	+ 0 37.3	+0.6664	0.5501	+0.2625	+82	− 7
κ Aquarii	5.2	4.40	24.6	4 39.3	14 42.1	+ 3 27.7	−0.8801	0.5490	0.2639	− 6	−90
207 B. Aquarii	6.3	4.39	25.0	3 59.1	16 5.0	+ 4 47.7	−1.1855	0.5485	0.2645	−27	−90
6 G. Piscium	6.2	4.38	25.9	2 50.3	11 0 3.2	−11 30.1	−0.2150	0.5459	0.2669	+30	−54
22 B. Piscium	6.4	4.35	27.1	− 0 9.7	11.42.5	− 0 14.2	+0.2150	0.5429	0.2673	+54	−31
κ Piscium	4.9	+4.34	+27.1	+ 0 48.2	13 17.1	+ 1 17.3	−0.3351	0.5426	+0.2671	+25	−61
9 Piscium	6.4	4.34	27.2	0 40.1	13 26.0	+ 1 25.9	−0.1604	0.5426	0.2671	+34	−51
16 Piscium	5.7	4.33	27.5	1 38.6	17 41.2	+ 5 32.6	−0.0086	0.5418	0.2661	+42	−42
λ Piscium	4.6	4.33	27.5	1 19.5	20 19.2	+ 8 5.4	+1.0131	0.5414	0.2654	+90	+13
19 Piscium	5.4	4.32	27.6	3 1.7	22 20.5	+10 2.7	−0.1709	0.5412	0.2647	+33	−51
22 Piscium	5.8	+4.32	+27.8	+ 2 28.3	12 0 56.3	−11 26.6	+1.0788	0.5408	+0.2636	+90	+18
36 Piscium	6.2	4.30	27.7	7 46.9	12 25.8	− 0 19.9	−1.3152	0.5401	0.2569	−40	−82
d Piscium	5.4	4.30	27.8	7 43.9	14 18.8	+ 1 29.4	−0.7827	0.5401	0.2555	+ 1	−82
136 B. Piscium	6.5	4.28	27.6	8 54.3	23 56.4	+10 48.0	+0.4402	0.5403	0.2472	+68	−17
75 Piscium	6.3	4.28	26.9	12 30.8	13 11 44.1	− 1 47.6	−0.4245	0.5412	0.2342	+20	−62
η Piscium	3.7	+4.28	+25.8	+14 55.2	23 15.8	+ 9 21.1	−0.3016	0.5428	+0.2188	+26	−53
101 Piscium	6.2	4.27	25.8	14 14.4	14 1 14.9	+11 16.2	+0.8370	0.5431	0.2159	+90	+ 9
105 Piscium	6.1	4.28	25.4	15 59.2	3 1.9	−11 0.3	−0.5966	0.5434	0.2133	+10	−70
3 Arietis	6.4	4.29	24.9	17 0.0	6 12.1	− 7 56.5	−0.9838	0.5440	0.2084	−14	−73
4 Arietis	5.8	4.28	25.0	16 32.7	6 56.2	− 7 13.9	−0.3574	0.5441	0.2072	+23	−55
ι Arietis	5.1	+4.28	+24.4	+17 24.9	11 8.0	− 3 10.5	−0.4112	0.5448	+0.2004	+20	−57
35 B. Arietis	6.4	4.27	24.0	17 51.4	14 2.2	− 0 22.1	−0.2994	0.5454	0.1955	+26	−50
47 B. Arietis	6.5	4.26	23.9	17 38.2	15 53.4	+ 1 25.3	+0.2905	0.5458	0.1923	+59	−18
20 H^1. Arietis	6.4	4.26	23.9	16 50.2	16 37.7	+ 2 8.1	+1.2701	0.5459	0.1910	+87	+46
15 Arietis	5.9	4.28	23.4	19 6.7	17 10.6	+ 2 39.8	−1.0101	0.5460	0.1901	−15	−71
θ Arietis	5.6	+4.28	+23.0	+19 31.2	20 35.2	+ 5 57.6	−0.8032	0.5466	+0.1839	− 2	−70
26 Arietis	6.2	4.26	22.3	19 29.4	15 2 15.2	+11 26.1	+0.2403	0.5478	0.1734	+56	−19
μ Arietis	5.7	4.24	21.6	19 39.6	7 32.8	− 7 27.3	+0.9523	0.5487	0.1631	+90	+22
ε Arietis (*mean*)	4.6	4.23	20.2	21 0.6	15 5.9	− 0 9.6	+0.6986	0.5501	0.1478	+90	+ 8
66 Arietis	6.1	4.20	17.7	22 31.2	16 4 7.2	−11 35.3	+0.8387	0.5520	0.1198	+90	+19
7 Tauri	5.9	+4.22	+16.9	+24 11.3	6 45.7	− 9 2.3	−0.6397	0.5523	+0.1140	+ 6	−62
11 Tauri	6.1	4.23	16.1	25 3.8	9 33.4	− 6 20.4	−1.2705	0.5526	0.1076	−50	−65
16 Tauri	5.4	4.19	16.1	24 1.8	11 21.4	− 4 36.2	+0.0288	0.5528	0.1036	+44	−22
17 Tauri	3.8	4.19	16.2	23 51.3	11 23.5	− 4 34.2	+0.2214	0.5528	0.1035	+55	−13
18 Tauri	5.6	4.20	15.9	24 34.9	11 30.5	− 4 27.4	−0.5476	0.5528	0.1032	+11	−55
q Tauri	4.3	+4.20	+16.0	+24 12.6	11 32.0	− 4 26.0	−0.1451	0.5528	+0.1032	+34	−32

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

SEPTEMBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1916.0. Δα	Red'ns from 1916.0. Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x′	y′	N.	S.
		s	″	° ′	d h m	h m				°	°
20 Tauri	4.1	+4.19	+16.0	+24 6.6	16 11 48.6	– 4 10.0	–0.0108	0.5528	+0.1025	+41	–24
21 Tauri	5.8	4.20	16.0	24 17.9	11 50.6	– 4 8.2	–0.2084	0.5528	0.1025	+30	–35
22 Tauri	6.5	4.19	16.0	24 16.3	11 54.3	– 4 4.5	–0.1736	0.5528	0.1023	+32	–33
23 Tauri	4.3	4.18	16.1	23 41.5	12 2.2	– 3 56.9	+0.4627	0.5528	0.1020	+73	0
η Tauri	3.0	4.18	16.0	23 51.0	12 32.8	– 3 27.3	+0.3438	0.5529	0.1009	+63	– 6
104 B. Tauri	5.5	+4.16	+16.1	+23 10.1	12 56.3	– 3 4.6	+1.1172	0.5529	+0.1000	+90	+41
27 Tauri	3.7	4.18	15.9	23 48.1	13 17.4	– 2 44.2	+0.4709	0.5529	0.0992	+73	0
28 Tauri	5.2	4.18	15.8	23 53.1	13 18.0	– 2 43.7	+0.3820	0.5529	0.0991	+66	– 4
14 H. Tauri	5.3	4.21	15.2	25 19.9	13 46.7	– 2 15.9	–1.1270	0.5530	0.0980	–30	–65
36 Tauri	5.6	4.13	14.7	23 52.8	20 0.8	+ 3 45.1	+1.0040	0.5533	0.0836	+90	+34
χ Tauri	5.3	+4.12	+12.7	+25 26.1	17 4 2.3	+11 29.8	–0.0824	0.5535	+0.0647	+37	–25
k Tauri	5.6	3.97	9.8	24 55.5	19 46.7	+ 2 41.1	+1.1999	0.5525	+0.0271	+87	+55
118 Tauri	5.4	3.85	7.1	25 5.1	18 9 37.3	– 7 57.0	+1.1752	0.5502	–0.0060	+90	+54
112 B. Aurigæ	5.7	3.86	5.8	26 52.5	13 6.7	– 4 34.9	–0.8227	0.5495	0.0142	– 6	–63
125 Tauri	5.1	3.82	6.0	25 51.2	14 17.5	– 3 26.5	+0.2807	0.5492	0.0170	+59	– 1
139 Tauri	4.7	+3.74	+ 4.3	+25 56.7	22 31.0	+ 4 30.2	–0.0396	0.5470	–0.0361	+40	–20
52 B. Geminorum	6.5	3.51	1.4	24 39.7	19 16 35.3	– 2 2.2	+0.3580	0.5410	0.0763	+65	– 3
ε Geminorum	3.2	3.50	0.6	25 12.9	19 35.0	+ 0 51.6	–0.4918	0.5399	0.0827	+14	–50
87 B. Geminorum	5.8	3.41	+ 0.4	23 42.1	23 22.5	+ 4 31.5	+0.8531	0.5384	0.0906	+90	+23
37 Geminorum	5.7	3.44	– 0.4	25 28.9	20 0 53.6	+ 5 59.7	–1.2549	0.5378	0.0937	–47	–65
ω Geminorum	5.2	+3.38	– 0.6	+24 20.2	4 15.0	+ 9 14.5	–0.3140	0.5365	–0.1005	+24	–41
44 Geminorum	5.9	3.32	0.3	22 45.8	5 38.5	+10 35.3	+1.2834	0.5360	0.1034	+74	+60
48 Geminorum	5.8	3.32	1.4	24 16.2	8 59.6	–10 10.1	–0.7406	0.5346	0.1100	0	–66
δ Geminorum	3.5	3.23	1.3	22 8.3	12 41.4	– 6 35.5	+1.1997	0.5330	0.1172	+90	+47
58 Geminorum	6.0	3.23	2.0	23 6.4	14 16.4	– 5 3.6	–0.0616	0.5324	0.1202	+37	–29
149 B. Geminorum	6.4	+3.17	– 1.7	+21 42.2	15 55.6	– 3 27.5	+1.2906	0.5317	–0.1234	+75	+59
B. D.+23° 1744	6.4	3.18	2.6	23 4.0	18 46.9	– 0 41.7	–0.5780	0.5305	0.1286	+10	–60
187 B. Geminorum	6.3	3.15	3.3	23 12.8	22 42.9	+ 3 6.8	–1.2603	0.5288	0.1358	–44	–67
192 B. Geminorum	6.3	3.12	3.3	22 35.9	23 53.4	+ 4 15.1	–0.7395	0.5283	0.1379	0	–67
85 Geminorum	5.2	3.00	3.5	20 6.3	21 5 56.7	+10 7.0	+1.1522	0.5258	0.1485	+90	+38
217 B. Geminorum	6.3	+2.97	– 3.9	+20 2.8	8 28.4	–11 26.1	+0.8370	0.5248	–0.1527	+90	+15
SATURN	0.5	. . .	. . .	20 30.3	11 15.5	– 8 44.2	–0.1027	0.5199	0.1566	+36	–36
d^1 Cancri	5.9	2.82	5.1	18 36.1	19 44.4	– 0 30.8	+0.6121	0.5203	0.1706	+85	0
NEPTUNE	7.8	. . .	. . .	18 57.1	23 38.2	+ 3 15.9	–0.4510	0.5177	0.1761	+18	–58
θ Cancri	5.5	2.78	5.6	18 22.6	23 53.8	+ 3 30.9	+0.1376	0.5186	0.1768	+50	–25
δ Cancri	4.2	+2.72	– 6.7	+18 27.7	22 6 33.0	+ 9 58.2	–1.1632	0.5163	–0.1861	–28	–72
54 Cancri	6.3	2.63	6.1	15 39.7	9 50.5	–10 50.2	+1.3090	0.5150	0.1905	+82	+50
X Cancri (*var.*)	6.2	2.65	7.0	17 33.0	12 3.1	– 8 41.5	–1.1994	0.5144	0.1934	–31	–72
o^1 Cancri	5.1	2.61	6.6	15 38.6	13 2.1	– 7 44.3	+0.7123	0.5141	0.1947	+90	+ 2
o^2 Cancri	5.7	2.61	6.7	15 54.2	13 12.4	– 7 34.2	+0.3934	0.5140	0.1949	+66	–15
VENUS	–3.9	. . .	. . .	+15 17.4	19 40.8	– 1 17.4	–0.2198	0.4666	–0.1937	+31	–48
81 Cancri	6.4	+2.51	– 7.3	15 20.0	20 52.0	– 0 8.2	–0.5077	0.5117	0.2042	+15	–65
π Cancri	5.6	2.52	7.7	15 17.3	22 22.5	+ 1 19.7	–0.7676	0.5113	0.2059	0	–75
ξ Leonis	5.1	2.39	7.9	11 40.2	23 7 10.9	+ 9 52.6	+1.3555	0.5091	0.2154	+77	+53
18 Leonis	5.8	2.35	8.8	12 11.7	14 48.3	– 6 43.2	–0.8912	0.5075	0.2227	– 6	–78
19 Leonis	6.4	+2.34	– 8.8	+11 57.3	15 21.7	– 6 10.8	–0.7519	0.5075	–0.2232	+ 2	–78
R Leonis (*var.*)	5–10	2.34	8.8	11 49.0	15 25.6	– 6 6.9	–0.6151	0.5074	0.2232	+ 9	–75
83 B. Leonis	5.9	2.27	8.7	9 19.8	20 10.2	– 1 30.5	+1.0412	0.5067	0.2273	+90	+18
43 Leonis	6.3	2.16	9.8	6 58.0	24 10 22.6	–11 42.4	+0.3145	0.5054	0.2374	+60	–24
155 B. Leonis	6.5	2.13	9.6	+ 6 7.1	10 31.2	–11 34.1	+1.2056	0.5053	0.2375	+90	+30
				NEW	*MOON.*						
43 H. Virginis	5.5	+2.18	–14.8	–17 48.8	29 7 26.5	+ 5 48.6	–0.6607	0.5522	–0.1871	– 2	–90
231 G. Virginis	6.4	2.19	14.8	18 12.0	8 10.8	+ 6 31.3	–0.3951	0.5527	0.1859	+12	–66
236 G. Virginis	5.7	+2.19	–14.9	–18 19.9	8 53.0	+ 7 12.2	–0.3879	0.5532	–0.1847	+13	–66

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

SEPTEMBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1916.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
9 G. Libræ	6.5	+2.28	-15.0	-20 4.5	29 16 0.9	- 9 55.0	+0.1567	0.5585	-0.1720	+39	-33
17 G. Libræ	6.4	2.34	15.0	20 49.5	20 55.9	- 5 10.5	+0.1127	0.5620	0.1626	+36	-36
18 G. Libræ	6.1	2.34	15.0	20 58.6	21 22.7	- 4 44.6	+0.1988	0.5623	0.1617	+40	-31
43 B. Libræ	5.7	2.46	16.1	21 2.6	30 1 43.2	- 0 33.5	-0.4168	0.5654	0.1529	+ 7	-68
47 G. Libræ	6.1	2.46	14.7	21 42.6	5 33.8	+ 3 8.7	-0.2965	0.5681	0.1448	+13	-60
64 G. Libræ	5.8	+2.51	-14.4	-22 5.6	9 43.8	+ 7 9.4	-0.4831	0.5710	-0.1355	+ 2	-74
153 B. Libræ	6.3	2.63	14.4	24 12.5	16 38.9	-10 11.0	+0.8214	0.5755	0.1194	+66	+ 5
169 B. Libræ	6.0	2.64	13.9	22 52.0	18 34.3	- 8 19.9	-0.7889	0.5767	0.1147	-17	-90
177 B. Libræ	6.2	2.65	13.9	22 52.8	19 12.5	- 7 43.2	-0.8482	0.5771	0.1132	-21	-90
42 Libræ	5.0	+2.67	-14.0	-23 33.0	19 34.6	- 7 22.0	-0.1986	0.5773	-0.1123	+14	-54

OCTOBER.

A Scorpii	4.6	+2.77	-13.8	-25 4.9	1 0 58.0	- 2 10.9	+0.8105	0.5804	-0.0988	+65	+ 5
31 B. Scorpii	5.4	+2.76	-13.6	-24 17.3	1 5.6	- 2 3.6	-0.0193	0.5805	-0.0984	+22	-43
32 B. Scorpii	5.3	2.75	13.4	23 43.9	1 6.8	- 2 2.4	-0.5935	0.5805	0.0984	- 8	-84
3 Scorpii	5.9	2.77	13.8	25 0.0	1 23.4	- 1 46.6	+0.6849	0.5807	0.0977	+63	- 3
40 B. Scorpii	5.4	2.79	13.5	24 35.6	2 58.5	- 0 15.1	+0.1152	0.5816	0.0936	+29	-35
48 B. Scorpii	4.9	2.84	13.6	25 38.1	4 52.6	+ 1 34.5	+1.0146	0.5826	0.0886	+64	+20
50 B. Scorpii	6.4	+2.83	-13.2	-24 30.0	5 7.0	+ 1 48.4	-0.1764	0.5827	-0.0880	+13	-53
24 G. Scorpii	6.2	2.85	13.0	24 14.5	6 42.1	+ 3 19.8	-0.5772	0.5835	0.0838	- 8	-83
41 G. Scorpii	6.3	2.88	12.6	24 12.7	9 3.1	+ 5 35.3	-0.7972	0.5846	0.0775	-21	-90
85 B. Scorpii	6.0	2.91	12.8	25 16.1	9 29.2	+ 6 0.5	+0.2553	0.5849	0.0763	+35	-27
19 Scorpii	4.9	2.92	12.2	23 58.3	11 47.0	+ 8 12.8	-1.2454	0.5859	0.0701	-58	-81
σ Scorpii	3.1	+2.95	-12.6	-25 23.7	11 59.0	+ 8 24.4	+0.2042	0.5860	-0.0696	+31	-30
α Scorpii	1.2	3.02	12.4	26 15.0	15 13.0	+11 30.7	+0.8703	0.5873	0.0606	+64	+10
22 Scorpii	4.8	3.00	11.9	24 56.1	15 33.1	+11 50.0	-0.5000	0.5875	0.0597	- 7	-76
116 B. Scorpii	6.2	3.04	12.3	26 21.5	15 59.6	-11 44.6	+0.9359	0.5877	0.0585	+64	+14
88 B. Ophiuchi	6.3	3.20	10.1	24 58.1	2 3 11.3	- 0 59.6	-0.9665	0.5912	0.0266	-37	-90
26 Ophiuchi	5.8	+3.20	-10.0	-24 51.9	3 15.8	- 0 55.3	-1.0746	0.5912	-0.0264	-45	-90
118 B. Ophiuchi	6.2	3.28	10.1	26 24.2	5 51.4	+ 1 34.2	+0.4408	0.5918	0.0189	+41	-17
137 B. Ophiuchi	6.3	3.29	9.3	25 9.3	7 56.9	+ 3 34.6	-0.8684	0.5922	0.0128	-32	-90
36 Ophi. (*1st star*)	5.4	3.31	10.4	26 29.0	9 9.2	+ 4 44.0	+0.4761	0.5924	0.0093	+43	-15
θ Ophiuchi	3.4	3.34	8.5	24 55.1	11 44.2	+ 7 12.7	-1.1357	0.5928	-0.0017	-51	-90
136 G. Ophiuchi	6.3	+3.40	- 8.4	-25 52.3	13 37.3	+ 9 1.2	-0.1603	0.5929	+0.0039	+ 6	-52
151 G. Ophiuchi	6.0	3.44	8.2	26 12.5	15 28.7	+10 48.1	+0.1951	0.5931	0.0093	+26	-31
4 G. Sagittarii	6.2	3.56	7.1	26 56.9	21 55.5	- 7 0.7	+1.0696	0.5932	0.0283	+63	+26
63 Ophiuchi	6.1	3.55	5.9	24 52.4	3 0 26.7	- 4 35.6	-0.9636	0.5931	0.0357	-36	-90
67 B. Sagittarii	6.4	3.72	4.1	25 38.3	9 38.6	+ 4 14.0	+0.2668	0.5918	0.0623	+34	-27
70 B. Sagittarii	6.4	+3.72	- 3.6	-24 57.3	10 45.2	+ 5 18.0	-0.3569	0.5916	+0.0655	+ 1	-65
λ Sagittarii	2.9	3.77	3.4	25 28.2	13 15.2	+ 7 42.0	+0.3393	0.5910	0.0726	+39	-23
24 Sagittarii	5.7	3.77	2.2	24 5.8	15 34.7	+ 9 55.9	-0.8791	0.5904	0.0791	-26	-90
117 B. Sagittarii	5.8	3.78	1.6	23 34.7	17 23.4	+11 40.2	-1.2574	0.5899	0.0842	-58	-79
26 Sagittarii	6.1	3.81	1.4	23 54.8	18 41.6	-11 4.7	-0.8050	0.5895	0.0878	-21	-90
126 B. Sagittarii	5.7	+3.86	- 1.6	-25 5.8	19 50.3	- 9 58.7	+0.4985	0.5891	+0.0910	+51	-14
154 B. Sagittarii	5.9	3.87	+ 0.2	23 16.9	4 0 15.5	- 5 44.1	-0.9134	0.5876	0.1030	-26	-90
162 B. Sagittarii	6.4	3.94	- 0.2	24 59.4	1 9.0	- 4 52.7	+0.9112	0.5873	0.1054	+65	+12
127 G. Sagittarii	6.4	3.96	0.0	25 3.6	1 57.9	- 4 5.7	+1.0687	0.5870	0.1076	+65	+24
168 B. Sagittarii	6.3	3.89	+ 0.9	22 48.9	2 28.8	- 3 36.0	-1.1513	0.5867	0.1089	-44	-90
172 B. Sagittarii	5.8	+3.96	0.0	-24 57.8	2 46.8	- 3 18.7	+1.0594	0.5866	+0.1097	+65	+23
189 B. Sagittarii	6.1	3.99	+ 0.8	24 47.4	5 4.1	- 1 6.9	+1.1405	0.5857	0.1157	+65	+31
191 B. Sagittarii	6.5	3.94	1.3	23 19.4	5 17.3	- 0 54.1	-0.3190	0.5856	0.1163	+ 8	-62
208 B. Sagittarii	6.1	4.02	1.6	24 19.4	7 58.6	+ 1 40.8	+1.0150	0.5845	0.1232	+66	+19
222 B. Sagittarii	5.5	3.98	2.8	22 33.5	10 2.0	+ 3 39.3	-0.5119	0.5835	0.1285	- 1	-76
50 Sagittarii	5.5	+4.00	+ 3.6	-21 56.6	12 18.9	+ 5 50.9	-0.8355	0.5824	+0.1342	-18	-90

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

OCTOBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1916.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
253 B. Sagittarii	6.1	+4.01	+ 4.2	−21 29.2	4 14 9.8	+ 7 37.5	−1.0448	0.5816	+0.1387	−32	−90
σ Capricorni	5.5	4.18	9.6	19 22.7	5 10 3.6	+ 2 46.0	+0.0412	0.5710	0.1830	+34	−40
π Capricorni	5.2	4.18	10.7	18 29.1	13 23.6	+ 5 58.5	−0.2402	0.5691	0.1895	+20	−56
ρ Capricorni	5.0	4.18	11.0	18 5.3	14 2.8	+ 6 36.3	−0.5152	0.5688	0.1907	+ 6	−75
ο Capricorni	5.6	4.21	10.8	18 51.5	14 28.4	+ 7 0.9	+0.3433	0.5685	0.1916	+51	−23
47 B. Capricorni	6.2	+4.18	+12.0	−16 48.7	16 52.7	+ 9 19.9	−1.2563	0.5672	+0.1960	−45	−89
υ Capricorni	5.3	4.24	11.9	18 25.9	18 46.7	+11 9.8	+0.7540	0.5661	0.1995	+72	− 1
61 B. Capricorni	5.9	4.18	12.7	16 25.2	19 0.9	+11 23.4	−1.2286	0.5659	0.1999	−41	−90
94 B. Capricorni	5.7	4.25	14.3	16 21.1	6 2 21.3	− 5 32.0	+0.2157	0.5618	0.2123	+46	−30
95 B. Capricorni	5.9	4.21	14.8	14 48.2	2 49.0	− 5 5.3	−1.2466	0.5616	0.2130	−41	−90
29 Capricorni	5.5	+4.29	+16.1	−15 31.0	10 13.7	+ 2 3.5	+1.0932	0.5577	+0.2241	+74	+21
53 B. Aquarii	6.5	4.24	16.7	13 32.8	10 21.4	+ 2 10.9	−0.8652	0.5576	0.2243	−10	−90
18 Aquarii	5.5	4.27	17.6	13 14.1	13 57.9	+ 5 39.8	−0.3619	0.5558	0.2291	+18	−63
72 B. Aquarii	6.5	4.24	18.3	11 55.7	15 46.0	+ 7 24.0	−1.2651	0.5549	0.2314	−40	−90
137 B. Capricorni	6.2	4.26	19.4	10 57.0	20 46.6	−11 45.7	−1.0766	0.5525	0.2374	−22	−90
λ Capricorni	5.5	+4.31	+19.8	−11 44.9	23 56.2	− 8 42.7	+0.4846	0.5510	+0.2408	+66	− 16
96 B. Aquarii	6.5	4.30	20.6	10 42.1	7 3 7.9	− 5 37.6	+0.2032	0.5497	0.2440	+50	−31
θ Aquarii	4.3	4.33	22.9	8 11.7	13 43.6	+ 4 36.6	+0.3085	0.5456	0.2529	+58	−26
ρ Aquarii	5.3	4.34	23.1	8 14.2	15 16.6	+ 6 6.4	+0.7434	0.5450	0.2539	+82	− 3
170 B. Aquarii	6.0	4.34	23.5	7 36.8	16 49.1	+ 7 35.9	+0.5050	0.5445	0.2549	+71	−16
186 B. Aquarii	6.1	+4.35	+24.0	− 6 58.7	20 24.2	+11 3.8	+0.7809	0.5434	+0.2570	+83	0
κ Aquarii	5.2	4.32	24.9	4 39.3	23 24.9	−10 1.6	−0.7914	0.5426	0.2585	− 1	−90
207 B. Aquarii	6.3	4.32	25.4	3 59.1	8 0 49.8	− 8 39.5	−1.1037	0.5422	0.2591	−21	−90
6 G. Piscium	6.2	4.36	26.4	2 50.3	8 58.9	− 0 46.5	−0.1409	0.5403	0.2617	+34	−50
22 B. Piscium	6.4	4.39	28.0	− 0 9.7	20 51.8	+10 43.0	+0.2639	0.5386	0.2626	+57	−28
κ Piscium	4.9	+4.39	+28.2	+ 0 48.2	22 28.1	−11 43.8	−0.2955	0.5385	+0.2625	+26	−58
9 Piscium	6.4	4.39	28.2	0 40.1	22 37.1	−11 35.1	−0.1195	0.5385	0.2625	+36	−48
16 Piscium	5.7	4.40	28.7	1 38.6	9 2 56.4	− 7 24.2	+0.0226	0.5382	0.2618	+43	−40
λ Piscium	4.6	4.41	28.7	1 19.5	5 36.8	− 4 49.0	+1.0459	0.5381	0.2612	+90	+16
19 Piscium	5.4	4.42	29.1	3 1.7	7 39.9	− 2 49.9	−0.1533	0.5381	0.2605	+34	−50
22 Piscium	5.8	+4.44	+29.2	+ 2 28.3	10 17.7	− 0 17.2	+1.0992	0.5381	+0.2596	+90	+20
36 Piscium	6.2	4.47	30.0	7 46.9	21 54.6	+10 57.0	−1.3412	0.5387	0.2536	−44	−81
d Piscium	5.4	4.48	30.0	7 43.9	23 48.5	−11 12.8	−0.8103	0.5389	0.2523	− 2	−82
136 B. Piscium	6.5	4.52	29.9	8 54.3	10 9 29.6	− 1 50.7	+0.3937	0.5402	0.2446	+65	−19
75 Piscium	6.3	4.59	29.7	12 30.9	21 18.9	+ 9 35.2	−0.5033	0.5425	0.2323	+15	−67
η Piscium	3.7	+4.66	+28.8	+14 55.3	11 8 49.5	− 3 17.2	−0.4071	0.5452	+0.2174	+20	−59
101 Piscium	6.2	4.66	28.7	14 14.4	10 48.1	− 1 22.5	+0.7274	0.5457	0.2146	+90	+ 2
105 Piscium	6.1	4.69	28.4	15 59.3	12 34.7	+ 0 20.6	−0.7105	0.5462	0.2120	+ 4	−74
3 Arietis	6.4	4.71	28.1	17 0.0	15 44.0	+ 3 23.5	−1.1045	0.5470	0.2072	−23	−73
4 Arietis	5.8	4.71	28.0	16 32.7	16 27.8	+ 4 5.8	−0.4798	0.5472	0.2061	+16	−62
ι Arietis	5.1	+4.73	+27.5	+17 24.9	20 38.0	+ 8 7.6	−0.5426	0.5483	+0.1994	+12	−65
35 B. Arietis	6.4	4.74	27.1	17 51.5	23 31.1	+10 54.8	−0.4369	0.5491	0.1946	+18	−58
47 B. Arietis	6.5	4.74	27.0	17 38.2	12 1 21.3	−11 18.8	+0.1482	0.5496	0.1915	+50	−25
20 H^1. Arietis	6.4	4.74	26.8	16 50.3	2 5.3	−10 36.3	+1.1246	0.5498	0.1902	+90	+31
15 Arietis	5.9	4.78	26.6	19 6.7	2 37.9	−10 4.8	−1.1528	0.5500	0.1893	−28	−71
θ Arietis	5.6	+4.79	+26.2	+19 31.2	6 0.8	− 6 48.8	−0.9529	0.5508	+0.1832	−13	−70
26 Arietis	6.2	4.80	25.4	19 29.4	11 37.6	− 1 23.6	+0.0772	0.5523	0.1728	+46	−27
μ Arietis	5.7	4.82	24.5	19 39.7	16 51.8	+ 3 39.8	+0.7768	0.5536	0.1626	+90	+11
47 Arietis	5.8	4.84	23.3	20 20.3	23 49.6	+10 23.0	+1.1476	0.5552	0.1484	+90	+39
ε Arietis (*mean*)	4.6	4.85	23.1	21 0.7	13 0 19.7	+10 52.2	+0.5102	0.5553	0.1474	+76	− 2
66 Arietis	6.1	+4.88	+20.4	+22 31.3	13 10.9	− 0 43.6	+0.6280	0.5576	+0.1194	+88	+ 7
7 Tauri	5.9	4.93	19.6	24 11.3	15 47.4	+ 1 47.3	−0.8473	0.5580	0.1136	− 7	−66
16 Tauri	5.4	4.92	18.6	24 1.9	20 19.3	+ 6 9.6	−0.1888	0.5585	0.1031	+31	−34
17 Tauri	3.8	4.91	18.7	23 51.3	20 21.3	+ 6 11.5	+0.0029	0.5585	0.1030	+42	−24
18 Tauri	5.6	4.93	18.5	24 34.9	20 28.2	+ 6 18.3	−0.7623	0.5585	0.1028	− 2	−65
q Tauri	4.3	+4.92	+18.6	+24 12.6	20 29.7	+ 6 19.7	−0.3620	0.5585	+0.1027	+22	−44

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

OCTOBER.

The Star's					At Conjunction in R. A.				
Name.	Mag.	Red'ns from 1916.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'
		Δα	Δδ						
		s	″	° ′	d h m	h m			
20 Tauri	4.1	+4.92	+18.6	+24 6.7	18 20 46.0	+ 6 35.4	−0.2287	0.5585	+0.1021
21 Tauri	5.8	4.93	18.5	24 17.9	20 48.0	+ 6 37.3	−0.4254	0.5585	0.1020
22 Tauri	6.5	4.92	18.5	24 16.3	20 51.7	+ 6 40.9	−0.3909	0.5585	0.1019
23 Tauri	4.3	4.91	18.6	23 41.6	20 59.5	+ 6 48.4	+0.2420	0.5585	0.1016
η Tauri	3.0	4.91	18.4	23 51.1	21 29.7	+ 7 17.5	+0.1231	0.5586	0.1004
104 B. Tauri	5.5	+4.89	+18.5	+23 10.1	21 52.9	+ 7 39.9	+0.8919	0.5586	+0.0995
27 Tauri	3.7	4.91	18.3	23 48.2	22 13.7	+ 8 0.1	+0.2484	0.5587	0.0987
28 Tauri	5.2	4.91	18.2	23 53.2	22 14.3	+ 8 0.6	+0.1600	0.5587	0.0987
36 Tauri	5.6	4.89	16.8	23 52.8	14 4 51.5	− 9 36.3	+0.7696	0.5591	0.0831
χ Tauri	5.3	4.92	14.6	25 26.2	12 46.4	− 1 58.3	−0.3208	0.5590	0.0641
62 Tauri	6.1	+4.87	+14.8	+24 6.6	13 24.6	− 1 21.4	+1.1489	0.5590	+0.0626
k Tauri	5.6	4.82	11.0	24 55.5	15 4 18.4	−10 59.3	+0.9377	0.5576	+0.0264
118 Tauri	5.4	4.73	7.6	25 5.1	17 59.4	+ 2 12.9	+0.9012	0.5546	−0.0067
112 B. Aurigæ	5.7	4.76	6.2	26 52.5	21 26.6	+ 5 32.8	−1.0894	0.5535	0.0150
125 Tauri	5.1	4.72	6.2	25 51.2	22 36.7	+ 6 40.5	+0.0077	0.5532	0.0177
139 Tauri	4.7	+4.65	+ 4.2	+25 56.7	16 6 45.6	− 9 27.5	−0.3167	0.5505	−0.0368
5 Geminorum	5.9	4.54	3.2	24 26.4	12 53.2	− 3 32.5	+1.0666	0.5482	0.0508
52 B. Geminorum	6.5	4.42	+ 0.3	24 39.7	17 0 42.6	+ 7 52.9	+0.0705	0.5431	0.0767
ε Geminorum	3.2	4.41	− 0.6	25 12.9	3 41.4	+10 45.8	−0.7777	0.5418	0.0830
87 B. Geminorum	5.8	4.31	0.9	23 42.1	7 28.0	− 9 35.2	+0.5620	0.5400	0.0909
ω Geminorum	5.2	+4.28	− 2.2	+24 20.1	12 19.5	− 4 53.3	−0.6029	0.5377	−0.1008
44 Geminorum	5.9	4.21	2.0	22 45.8	13 42.8	− 3 32.6	+0.9902	0.5370	0.1035
48 Geminorum	5.8	4.22	3.2	24 16.2	17 3.6	− 0 18.4	−1.0293	0.5354	0.1100
δ Geminorum	3.5	4.11	3.3	22 8.2	20 45.0	+ 3 15.8	+0.9065	0.5336	0.1171
58 Geminorum	6.0	4.12	4.0	23 6.4	22 19.9	+ 4 47.7	−0.3524	0.5328	0.1201
149 B. Geminorum	6.4	+4.04	− 3.8	+21 42.2	23 59.1	+ 6 23.7	+0.9974	0.5320	−0.1232
63 Geminorum	5.3	4.05	3.9	21 37.0	18 0 24.4	+ 6 48.3	+1.0408	0.5318	0.1240
B. D.+23° 1744	6.4	4.06	4.9	23 4.0	2 50.3	+ 9 9.5	−0.8679	0.5306	0.1284
192 B. Geminorum	6.3	3.99	5.7	22 35.8	7 57.0	− 9 53.5	−1.0289	0.5281	0.1375
79 Geminorum	6.3	3.91	5.2	20 31.0	8 51.2	− 9 1.0	+1.1460	0.5277	0.1390
85 Geminorum	5.2	+3.84	− 6.0	+20 6.3	14 0.8	− 4 1.1	+0.8621	0.5251	−0.1477
217 B. Geminorum	6.3	3.81	6.5	20 2.7	16 32.9	− 1 33.8	+0.5479	0.5239	0.1519
10 H. Cancri	6.1	3.76	6.6	19 4.7	18 31.6	+ 0 21.2	+1.3141	0.5230	0.1551
SATURN	0.4	. . .	. . .	20 10.6	23 4.8	+ 4 46.1	−0.6241	0.5191	0.1619
d^1 Cancri	5.9	3.63	8.0	18 36.0	19 3 51.2	+ 9 23.7	+0.3282	0.5188	0.1694
θ Cancri	5.5	+3.58	− 8.7	+18 22.6	8 1.6	−10 33.5	−0.1438	0.5170	−0.1754
NEPTUNE	7.7	. . .	. . .	18 50.3	8 45.8	− 9 50.6	−0.7834	0.5163	0.1763
54 Cancri	6.3	3.39	9.3	15 39.6	18 1.4	− 0 51.5	+1.0352	0.5131	0.1888
o^1 Cancri	5.1	3.37	9.8	15 38.6	21 14.1	+ 2 15.5	+0.4412	0.5120	0.1928
o^2 Cancri	5.7	3.37	10.0	15 54.1	21 24.4	+ 2 25.4	+0.1223	0.5119	0.1930
81 Cancri	6.4	+3.24	−10.7	+15 19.9	20 5 6.8	+ 9 54.2	−0.7718	0.5095	−0.2021
π Cancri	5.6	3.25	11.1	15 17.3	6 37.8	+11 22.7	−1.0302	0.5090	0.2037
ξ Leonis	5.1	3.08	11.2	11 40.2	15 29.6	− 4 1.0	+1.1051	0.5067	0.2130
18 Leonis	5.8	3.01	12.2	12 11.6	23 9.8	+ 3 26.1	−1.1328	0.5052	0.2201
19 Leonis	6.4	3.00	12.2	11 57.2	23 43.4	+ 3 58.8	−0.9925	0.5051	0.2206
R Leonis (*var.*)	5–10	+3.00	−12.2	+11 48.9	23 47.4	+ 4 2.6	−0.8555	0.5051	−0.2206
83 B. Leonis	5.9	2.90	12.0	9 19.7	21 4 33.7	+ 8 40.8	+0.8092	0.5044	0.2246
89 B. Leonis	6.2	2.89	11.9	8 42.7	5 28.2	+ 9 33.8	+1.2798	0.5043	0.2253
π Leonis	4.9	2.87	12.0	8 26.7	6 35.5	+10 39.2	+1.3192	0.5042	0.2262
43 Leonis	6.3	2.74	13.0	6 58.0	18 50.5	− 1 26.7	+0.1067	0.5035	0.2346
155 B. Leonis	6.5	+2.72	−12.7	+ 6 7.0	18 59.1	− 1 18.3	+0.9983	0.5035	−0.2347
35 Sextantis	6.1	2.63	13.4	5 11.1	22 5 47.3	+ 9 11.6	−0.5563	0.5039	0.2404
p^4 Leonis	5.7	2.48	13.8	2 24.5	18 26.3	− 2 31.1	−0.6179	0.5058	0.2449
p^5 Leonis	5.3	2.45	13.5	0 23.0	22 4.9	+ 1 1.3	+0.6723	0.5066	0.2457
359 B. Leonis	6.3	2.42	14.0	+ 0 35.4	23 3 8.6	+ 5 56.4	−0.7948	0.5080	0.2465
388 B. Leonis	6.3	+2.39	−13.7	− 1 14.5	5 34.7	+ 8 18.3	+0.5730	0.5088	−0.2467

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

OCTOBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1916.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	″	° ′	d h m	h m				°	°
B. Leonis	6.2	+2.35	−13.9	− 1 58.5	**23** 11 6.5	−10 19.5	−0.0049	0.5105	−0.2469	+41	−42
B. Virginis	6.5	2.24	14.2	5 15.4	**24** 5 38.6	+ 7 39.7	−1.0548	0.5186	0.2435	−18	−90
				NEW	*MOON.*						
B. Scorpii	5.4	+2.59	−11.8	−24 35.6	**28** 9 30.4	+ 8 4.4	+0.2856	0.5898	−0.0929	+38	−26
B. Scorpii	4.9	2.63	11.8	25 38.1	11 21.9	+ 9 51.5	+1.1795	0.5908	0.0879	+64	+37
B. Scorpii	6.4	2.62	11.6	24 29.9	11 36.0	+10 5.0	+0.0008	0.5909	0.0873	+22	−42
B. Scorpii	5.7	2.61	11.3	23 22.9	12 28.4	+10 55.3	−1.2128	0.5913	0.0849	−53	−87
G. Scorpii	6.2	2.63	11.4	24 14.5	13 9.0	+11 34.3	−0.3932	0.5917	0.0831	+ 1	−67
G. Scorpii	5.8	+2.62	−11.2	−23 27.9	13 29.8	+11 54.2	−1.2125	0.5919	−0.0821	−53	−87
G. Scorpii	6.3	2.65	11.1	24 12.7	15 26.8	−10 13.4	−0.6071	0.5928	0.0767	−11	−86
B. Scorpii	6.0	2.67	11.2	25 16.1	15 52.3	− 9 48.9	+0.4357	0.5930	0.0755	+46	−17
Scorpii	4.9	2.68	10.7	23 58.2	18 7.2	− 7 39.4	−1.0465	0.5940	0.0692	−39	−90
Scorpii	3.1	2.70	11.0	25 23.7	18 18.8	− 7 28.3	+0.3893	0.5940	0.0687	+42	−20
Scorpii	1.2	+2.76	−10.7	−26 15.0	21 28.7	− 4 26.1	+1.0544	0.5953	−0.0597	+64	+24
Scorpii	4.8	2.74	10.4	24 56.0	21 48.3	− 4 7.2	−0.3023	0.5954	0.0587	+ 4	−60
B. Scorpii	6.2	2.76	10.7	26 21.5	22 14.3	− 3 42.3	+1.1206	0.5956	0.0575	+64	+30
B. Scorpii	6.1	2.78	9.7	24 18.5	**29** 2 11.9	+ 0 5.6	−1.1671	0.5969	0.0460	−51	−90
B. Ophiuchi	6.3	2.88	8.8	24 58.1	9 12.4	+ 6 48.9	−0.7472	0.5985	0.0254	−23	−90
Ophiuchi	5.8	+2.88	− 8.8	−24 51.9	9 16.8	+ 6 53.1	−0.8543	0.5986	−0.0252	−30	−90
B. Ophiuchi	6.2	2.94	8.7	26 24.2	11 49.4	+ 9 19.6	+0.6517	0.5989	0.0176	+57	− 4
B. Ophiuchi	6.3	2.95	8.1	25 9.3	13 52.7	+11 17.8	−0.6436	0.5992	0.0115	−18	−90
Ophi. (*1st star*)	5.4	2.96	9.2	26 29.0	15 3.7	−11 34.1	+0.6915	0.5993	0.0079	+60	− 2
Ophiuchi	3.4	2.98	7.4	24 55.1	17 36.0	− 9 8.1	−0.9039	0.5994	−0.0003	−35	−90
G. Ophiuchi	6.3	+3.03	− 7.3	−25 52.3	19 27.2	− 7 21.5	+0.0662	0.5995	+0.0052	+18	−38
G. Ophiuchi	6.0	3.06	7.1	26 12.5	21 16.7	− 5 36.5	+0.4212	0.5994	0.0107	+39	−18
Ophiuchi	6.1	3.15	5.1	24 52.4	**30** 6 6.7	+ 2 51.8	−0.7187	0.5985	0.0371	−21	−90
Sagittarii	5.5	3.18	4.4	24 17.0	9 9.2	+ 5 46.8	−1.1879	0.5979	0.0461	−53	−89
Sagittarii	6.0	3.19	4.3	24 21.9	9 32.5	+ 6 9.2	−1.0880	0.5978	0.0472	−44	−90
B. Sagittarii	6.4	+3.29	− 3.6	−25 38.3	15 11.9	+11 34.8	+0.5140	0.5962	+0.0637	+50	−12
B. Sagittarii	6.4	3.29	3.1	24 57.3	16 17.8	−11 22.0	−0.1053	0.5959	0.0668	+15	−48
Sagittarii	2.9	3.33	2.9	25 28.2	18 46.3	− 8 59.5	+0.5899	0.5950	0.0739	+56	− 8
Sagittarii	5.7	3.33	1.9	24 5.8	21 4.6	− 6 46.8	−0.6208	0.5941	0.0804	−11	−88
B. Sagittarii	5.8	3.34	1.3	23 34.7	22 52.4	− 5 3.4	−0.9961	0.5934	0.0854	−34	−90
Sagittarii	6.1	+3.37	− 1.2	−23 54.8	**31** 0 10.0	− 3 49.0	−0.5446	0.5928	+0.0890	− 6	−80
B. Sagittarii	5.7	3.41	− 1.3	25 5.8	1 18.2	− 2 43.5	+0.7550	0.5923	0.0921	+65	+ 2
Sagittarii	5.0	3.40	+ 0.2	22 51.0	4 58.8	+ 0 48.2	−1.1596	0.5905	0.1021	−46	−90
Sagittarii	5.1	3.41	0.3	22 46.6	5 21.0	+ 1 9.6	−1.1946	0.5904	0.1031	−49	−90
B. Sagittarii	5.9	3.42	+ 0.2	23 16.9	5 41.7	+ 1 29.4	−0.6487	0.5902	0.1040	−10	−90
B. Sagittarii	6.4	+3.48	− 0.2	−24 59.4	6 35.0	+ 2 20.7	+1.1711	0.5897	+0.1064	+65	+35
B. Sagittarii	6.3	3.44	+ 0.9	22 48.9	7 54.4	+ 3 36.9	−0.8846	0.5890	0.1098	−24	−90
B. Sagittarii	6.5	3.49	1.2	23 19.4	10 42.2	+ 6 18.1	−0.0526	0.5875	0.1171	+22	−45
B. Sagittarii	6.1	3.56	1.5	24 19.4	13 23.0	+ 8 52.5	+1.2807	0.5860	0.1239	+66	+52
B. Sagittarii	5.5	3.53	2.6	22 33.5	15 26.2	+10 50.8	−0.2424	0.5848	0.1291	+13	−56
Sagittarii	5.5	+3.55	+ 3.2	−21 56.6	17 43.0	−10 57.7	−0.5646	0.5834	+0.1347	− 3	−81
B. Sagittarii	6.1	+3.56	+ 3.8	−21 29.2	19 33.8	− 9 11.2	−0.7730	0.5823	+0.1391	−14	−90

NOVEMBER.

Capricorni	5.5	+3.73	+ 8.8	−19 22.8	**1** 15 32.2	+10 2.0	+0.3183	0.5691	+0.1821	+49	−24
Capricorni	5.2	3.75	9.8	18 29.1	18 53.9	−10 43.8	+0.0360	0.5668	0.1884	+34	−40
Capricorni	5.0	3.74	10.0	18 5.4	19 33.5	−10 5.6	−0.2399	0.5664	0.1896	+20	−56
Capricorni	5.6	3.77	9.8	18 51.6	19 59.3	− 9 40.7	+0.6215	0.5661	0.1904	+68	− 8
B. Capricorni	6.2	3.75	11.0	16 48.7	22 25.0	− 7 20.3	−0.9844	0.5645	0.1947	−21	−90
Capricorni	5.3	+3.80	+10.9	−18 25.9	**2** 0 20.2	− 5 29.3	+1.0336	0.5632	+0.1979	+72	+18

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

NOVEMBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1916.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
61 B. Capricorni	5.9	+3.76	+11.7	−16 25.2	2 0 34.5	− 5 15.6	−0.9573	0.5630	+0.1983	−19	−90
94 B. Capricorni	5.7	3.84	13.1	16 21.1	8 0.3	+ 1 54.3	+0.4914	0.5581	0.2102	+63	−15
95 B. Capricorni	5.9	3.80	13.8	14 48.3	8 28.4	+ 2 21.4	−0.9791	0.5578	0.2109	−19	−90
53 B. Aquarii	6.5	3.86	15.6	13 32.8	16 7.6	+ 9 44.3	−0.6004	0.5531	0.2215	+ 5	−82
18 Aquarii	5.5	3.89	16.4	13 14.1	19 47.6	−10 43.0	−0.0964	0.5509	0.2261	+32	−47
72 B. Aquarii	6.5	+3.87	+17.1	−11 55.7	21 37.5	− 8 56.9	−1.0077	0.5499	+0.2283	−18	−90
137 B. Capricorni	6.2	3.90	18.3	10 57.0	3 2 43.6	− 4 1.4	−0.8228	0.5471	0.2339	− 7	−90
λ Capricorni	5.5	3.95	18.5	11 44.9	5 56.9	− 0 54.6	+0.7481	0.5454	0.2371	+78	− 2
96 B. Aquarii	6.5	3.96	19.4	10 42.1	9 12.4	+ 2 14.3	+0.4610	0.5438	0.2401	+65	−17
θ Aquarii	4.3	4.02	21.8	8 11.8	20 1.8	−11 17.9	+0.5540	0.5392	0.2483	+74	−13
ρ Aquarii	5.3	+4.04	+22.0	− 8 14.2	21 36.8	− 9 45.8	+0.9910	0.5386	+0.2493	+82	+13
170 B. Aquarii	6.0	4.04	22.4	7 36.8	23 11.4	− 8 14.4	+0.7480	0.5380	0.2502	+82	− 2
186 B. Aquarii	6.1	4.07	23.0	6 58.7	4 2 51.4	− 4 41.4	+1.0212	0.5368	0.2521	+83	+15
κ Aquarii	5.2	4.05	24.1	4 39.3	5 56.4	− 1 42.5	−0.5724	0.5359	0.2535	+11	−78
207 B. Aquarii	6.3	4.06	24.6	3 59.1	7 23.3	− 0 18.4	−0.8905	0.5354	0.2540	− 7	−90
6 G. Piscium	6.2	+4.13	+25.7	− 2 50.3	15 44.1	+ 7 46.3	+0.0674	0.5334	+0.2564	+45	−38
22 B. Piscium	6.4	4.21	27.6	− 0 9.7	5 3 54.4	− 4 26.8	+0.4519	0.5318	0.2571	+69	−18
κ Piscium	4.9	4.22	27.8	+ 0 48.2	5 33.0	− 2 51.3	−0.1175	0.5317	0.2569	+35	−48
9 Piscium	6.4	4.22	27.9	0 40.1	5 42.2	− 2 42.4	+0.0602	0.5317	0.2569	+45	−38
16 Piscium	5.7	4.25	28.5	1 38.6	10 7.8	+ 1 34.8	+0.1939	0.5315	0.2562	+52	−31
λ Piscium	4.6	+4.27	+28.3	+ 1 19.5	12 52.1	+ 4 13.9	+1.2226	0.5315	+0.2556	+90	+30
19 Piscium	5.4	4.29	29.0	3 1.7	14 58.0	+ 6 15.8	+0.0049	0.5315	0.2550	+42	−41
22 Piscium	5.8	4.32	29.0	2 28.3	17 39.6	+ 8 52.3	+1.2649	0.5316	0.2541	+90	+35
36 Piscium	6.2	4.41	30.5	7 46.9	6 5 32.3	− 3 37.6	−1.2317	0.5327	0.2483	−31	−82
d Piscium	5.4	4.44	30.5	7 43.9	7 28.7	− 1 44.9	−0.7000	0.5330	0.2470	+ 5	−82
136 B. Piscium	6.5	+4.52	+30.6	+ 8 54.3	17 21.8	+ 7 49.3	+0.4908	0.5349	+0.2396	+72	−14
75 Piscium	6.3	4.66	30.8	12 30.9	7 5 24.1	− 4 31.8	−0.4471	0.5381	0.2277	+18	−63
η Piscium	3.7	4.80	30.3	14 55.3	17 5.5	+ 6 46.6	−0.3810	0.5418	0.2134	+21	−57
101 Piscium	6.2	4.81	30.0	14 14.4	19 5.8	+ 8 42.9	+0.7568	0.5425	0.2107	+90	+ 5
105 Piscium	6.1	4.85	30.0	15 59.3	20 53.8	+10 27.4	−0.6968	0.5431	0.2081	+ 4	−74
3 Arietis	6.4	+4.90	+29.8	+17 0.1	8 0 5.5	−10 27.2	−1.1018	0.5442	+0.2035	−23	−73
4 Arietis	5.8	4.90	29.7	16 32.8	0 49.9	− 9 44.3	−0.4747	0.5445	0.2024	+16	−62
ι Arietis	5.1	4.95	29.3	17 25.0	5 3.0	− 5 39.6	−0.5488	0.5460	0.1959	+12	−65
35 B. Arietis	6.4	4.98	28.9	17 51.5	7 57.8	− 2 50.7	−0.4499	0.5470	0.1912	+17	−59
47 B. Arietis	6.5	4.99	28.7	17 38.3	9 49.2	− 1 3.0	+0.1341	0.5477	0.1882	+49	−26
20 H^1. Arietis	6.4	+4.99	+28.4	+16 50.3	10 33.6	− 0 20.2	+1.1144	0.5480	+0.1870	+90	+31
15 Arietis	5.9	5.03	28.6	19 6.7	11 6.5	+ 0 11.6	−1.1781	0.5482	0.1860	−31	−71
θ Arietis	5.6	5.06	28.2	19 31.3	14 31.2	+ 3 29.5	−0.9854	0.5494	0.1802	−15	−70
26 Arietis	6.2	5.12	27.2	19 29.4	20 10.6	+ 8 57.3	+0.0360	0.5514	0.1700	+44	−29
μ Arietis	5.7	5.16	26.3	19 39.7	9 1 26.8	− 9 57.5	+0.7254	0.5532	0.1600	+90	+ 9
47 Arietis	5.8	+5.24	+25.1	+20 20.4	8 26.6	− 3 12.1	+1.0797	0.5553	+0.1460	+90	+33
ε Arietis (*mean*)	4.6	5.24	25.0	21 0.7	8 56.8	− 2 42.9	+0.4388	0.5555	0.1450	+70	− 5
66 Arietis	6.1	5.36	22.2	22 31.3	21 49.7	+ 9 43.0	+0.5260	0.5589	0.1174	+77	+ 2
7 Tauri	5.9	5.43	21.6	24 11.4	10 0 26.2	−11 46.2	−0.9581	0.5594	0.1115	−15	−66
16 Tauri	5.4	5.44	20.4	24 1.9	4 58.0	− 7 23.9	−0.3084	0.5603	0.1012	+24	−40
17 Tauri	3.8	+5.44	+20.4	+23 51.3	5 0.0	− 7 22.0	−0.1165	0.5603	+0.1012	+35	−30
18 Tauri	5.6	5.46	20.4	24 34.9	5 6.9	− 7 15.3	−0.8831	0.5603	0.1009	−10	−65
q Tauri	4.3	5.45	20.4	24 12.6	5 8.4	− 7 13.9	−0.4822	0.5603	0.1008	+14	−51
20 Tauri	4.1	5.45	20.3	24 6.7	5 24.7	− 6 58.1	−0.3493	0.5603	0.1002	+22	−43
21 Tauri	5.8	5.46	20.3	24 17.9	5 26.7	− 6 56.2	−0.5463	0.5603	0.1001	+11	−55
22 Tauri	6.5	+5.45	+20.3	+24 16.3	5 30.4	− 6 52.6	−0.5119	0.5603	+0.1000	+13	−53
23 Tauri	4.3	5.44	20.3	23 41.6	5 38.2	− 6 45.1	+0.1216	0.5604	0.0997	+49	−17
η Tauri	3.0	5.44	20.2	23 51.1	6 8.3	− 6 16.1	+0.0014	0.5604	0.0985	+42	−24
104 B. Tauri	5.5	5.42	20.1	23 10.2	6 31.5	− 5 53.7	+0.7704	0.5605	0.0976	+90	+18
27 Tauri	3.7	5.44	20.0	23 48.2	6 52.3	− 5 33.7	+0.1253	0.5606	0.0968	+49	−17
28 Tauri	5.2	+5.44	+20.0	+23 53.2	6 52.9	− 5 33.1	+0.0367	0.5606	+0.0968	+44	−21

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

NOVEMBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1916.0. Δα	Red'ns from 1916.0. Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		s	″	° ′	d h m	h m				°	°
36 Tauri	5.6	+5.47	+18.3	+23 52.8	10 13 29.4	+ 0 49.4	+0.6327	0.5614	+0.0813	+89	+12
χ Tauri	5.3	5.55	16.1	25 26.2	21 22.9	+ 8 26.0	−0.4746	0.5618	0.0624	+15	−47
62 Tauri	6.1	5.50	16.0	24 6.6	22 1.0	+ 9 2.8	+0.9940	0.5618	0.0609	+90	+36
315 B. Tauri	6.3	5.52	12.1	24 27.7	11 12 1.7	− 1 26.3	+1.2337	0.5610	0.0266	+82	+59
k Tauri	5.6	5.54	11.8	24 55.5	12 50.7	− 0 39.1	+0.7533	0.5608	+0.0246	+90	+24
118 Tauri	5.4	+5.51	+ 7.8	+25 5.1	12 2 26.9	−11 31.8	+0.6925	0.5581	−0.0084	+90	+22
125 Tauri	5.1	5.52	6.3	25 51.2	7 2.6	− 7 5.7	−0.2076	0.5568	0.0194	+30	−27
132 Tauri	5.0	5.44	5.4	24 32.5	11 10.4	− 3 6.7	+1.1243	0.5554	0.0292	+90	+48
139 Tauri	4.7	5.48	3.9	25 56.7	15 8.5	+ 0 43.2	−0.5445	0.5540	0.0384	+11	−50
5 Geminorum	5.9	5.38	2.5	24 26.4	21 13.9	+ 6 36.0	+0.8275	0.5515	0.0524	+90	+25
8 Geminorum	6.1	+5.34	+ 2.0	+23 59.9	23 23.6	+ 8 41.2	+1.1941	0.5506	−0.0573	+89	+53
52 B. Geminorum	6.5	5.30	− 0.9	24 39.7	13 8 59.5	− 6 2.3	−0.1836	0.5461	0.0783	+31	−32
ε Geminorum	3.2	5.30	1.9	25 12.9	11 57.5	− 3 10.3	−1.0347	0.5446	0.0846	−22	−65
87 B. Geminorum	5.8	5.20	2.6	23 42.1	15 43.0	+ 0 27.7	+0.2987	0.5426	0.0924	+60	− 8
ω Geminorum	5.2	5.18	4.0	24 20.1	20 33.4	+ 5 8.6	−0.8710	0.5401	0.1021	− 9	−66
44 Geminorum	5.9	+5.10	− 4.0	+22 45.8	21 56.4	+ 6 28.9	+0.7191	0.5394	−0.1049	+90	+14
δ Geminorum	3.5	5.01	5.6	22 8.2	14 4 57.4	−10 44.0	+0.6279	0.5355	0.1184	+88	+ 7
58 Geminorum	6.0	5.03	6.3	23 6.4	6 32.1	− 9 12.3	−0.6320	0.5347	0.1213	+ 6	−63
149 B. Geminorum	6.4	4.94	6.3	21 42.2	8 11.1	− 7 36.6	+0.7156	0.5337	0.1243	+90	+11
63 Geminorum	5.3	4.95	6.5	21 37.0	8 36.4	− 7 12.0	+0.7585	0.5335	0.1251	+90	+14
B. D.+23° 1744	6.4	+4.98	− 7.4	+23 3.9	11 2.0	− 4 51.1	−1.1520	0.5322	−0.1295	−31	−67
79 Geminorum	6.3	4.82	8.1	20 31.0	17 2.6	+ 0 58.1	+0.8563	0.5288	0.1399	+90	+18
85 Geminorum	5.2	4.75	9.2	20 6.2	22 12.3	+ 5 58.1	+0.5684	0.5260	0.1485	+80	0
217 B. Geminorum	6.3	4.72	9.7	20 2.7	15 0 44.5	+ 8 25.6	+0.2522	0.5246	0.1526	+56	−17
10 H. Cancri	6.1	4.66	9.9	19 4.6	2 43.3	+10 20.7	+1.0176	0.5235	0.1557	+90	+26
SATURN	0.3	. . .	. . .	+20 6.9	8 21.7	− 8 11.2	−1.0337	0.5210	−0.1644	−19	−70
d^1 Cancri	5.9	+4.54	−11.7	18 36.0	12 4.3	− 4 35.3	+0.0254	0.5186	0.1696	+43	−31
d^2 Cancri	6.2	4.48	11.6	17 19.2	13 20.9	− 3 21.1	+1.2236	0.5180	0.1714	+90	+42
θ Cancri	5.5	4.48	12.5	18 22.5	16 15.7	− 0 31.5	−0.4494	0.5166	0.1754	+17	−58
NEPTUNE	7.7	. . .	. . .	18 49.2	17 9.2	+ 0 20.4	−1.0994	0.5164	0.1767	−24	−71
54 Cancri	6.3	+4.28	−13.4	+15 39.6	16 2 18.5	+ 9 13.4	+0.7290	0.5119	−0.1883	+90	+ 4
o^1 Cancri	5.1	4.25	14.0	15 38.5	5 32.5	−11 38.3	+0.1330	0.5105	0.1922	+49	−28
o^2 Cancri	5.7	4.26	14.1	15 54.0	5 42.9	−11 28.3	−0.1868	0.5105	0.1924	+31	−45
81 Cancri	6.4	4.11	15.1	15 19.9	13 28.7	− 3 56.0	−1.0842	0.5074	0.2010	−21	−75
π Cancri	5.6	4.12	15.6	15 17.2	15 0.6	− 2 26.7	−1.3435	0.5069	0.2027	−51	−72
ξ Leonis	5.1	+3.93	−15.7	+11 40.1	23 57.2	+ 6 14.5	+0.8005	0.5041	−0.2115	+90	+ 5
o Leonis	3.8	3.84	15.9	10 16.2	17 4 54.7	+11 3.6	+1.2819	0.5028	0.2158	+90	+41
19 Leonis	6.4	3.85	17.0	11 57.2	8 16.4	− 9 40.4	−1.3023	0.5020	0.2186	−41	−78
R Leonis (*var.*)	5–10	3.85	17.0	11 48.9	8 20.5	− 9 36.4	−1.1648	0.5020	0.2187	−27	−78
83 B. Leonis	5.9	3.74	16.7	9 19.6	13 10.1	− 4 54.9	+0.5097	0.5011	0.2224	+73	−12
89 B. Leonis	6.2	+3.72	−16.6	+ 8 42.6	14 5.2	− 4 1.4	+0.9828	0.5009	−0.2231	+90	+15
π Leonis	4.9	3.70	16.6	8 26.6	15 13.3	− 2 55.2	+1.0232	0.5007	0.2239	+90	+17
43 Leonis	6.3	3.54	17.7	6 57.9	18 3 37.8	+ 9 8.5	−0.1852	0.4995	0.2318	+32	−50
155 B. Leonis	6.5	3.52	17.4	6 7.0	3 46.6	+ 9 17.1	+0.7109	0.4995	0.2319	+90	− 3
35 Sextantis	6.1	3.41	18.2	5 11.0	14 43.6	− 4 4.2	−0.8398	0.4997	0.2372	− 3	−85
p^4 Leonis	5.7	+3.23	−18.4	+ 2 24.4	19 3 33.2	+ 8 23.9	−0.8845	0.5014	−0.2413	− 6	−88
p^5 Leonis	5.3	3.19	17.9	0 23.0	7 14.9	+11 59.3	+0.4178	0.5022	0.2421	+66	−20
359 B. Leonis	6.3	3.15	18.4	+ 0 35.3	12 22.8	− 7 1.7	−1.0481	0.5036	0.2428	−16	−89
388 B. Leonis	6.3	3.11	17.9	− 1 14.5	14 50.8	− 4 37.8	+0.3304	0.5044	0.2430	+60	−24
431 B. Leonis	6.2	3.06	18.0	1 58.6	20 26.8	+ 0 48.7	−0.2401	0.5063	0.2432	+29	−55
13 B. Virginis	5.9	+2.99	−17.5	− 4 52.3	20 3 7.4	+ 7 17.8	+1.2460	0.5090	−0.2427	+85	+33
78 B. Virginis	6.5	2.89	17.8	5 15.4	15 11.5	− 4 59.3	−1.2555	0.5152	0.2399	−35	−90
q Virginis	5.3	2.81	17.2	8 59.6	21 1 5.6	+ 4 36.9	+0.3605	0.5212	0.2356	+60	−23
370 B. Virginis	6.0	2.75	16.8	11 11.9	11 15.4	− 9 32.2	+0.3229	0.5284	0.2292	+57	−25
69 Virginis	4.9	2.68	15.8	15 32.6	22 3 3.0	+ 5 45.1	+1.3546	0.5412	0.2147	+70	+54
75 Virginis	5.6	+2.67	−16.0	−14 56.1	5 33.7	+ 8 10.8	+0.1847	0.5434	−0.2119	+46	−32

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

NOVEMBER.

The Star's					At Conjunction in R. A.					
Name.	Mag.	Red'ns from 1916.0.		Apparent Declination.	Greenwich Mean Time.		Hour Angle, H	Y	x'	y'
		Δα	Δδ							
		s	″	° ′	d	h m	h m			
83 Virginis	5.6	+2.66	−15.7	−15 45.7	**22**	10 53.2	−10 40.4	−0.0682	0.5481	−0.2053
85 Virginis	6.1	2.66	15.8	15 21.0		11 23.2	−10 11.4	−0.5972	0.5486	−0.2047
				NEW	*MOON.*					
67 B. Sagittarii	6.4	3.12	2.6	25 38.2	**26**	22 47.1	− 3 2.4	+0.6618	0.6063	+0.0665
70 B. Sagittarii	6.4	+3.12	− 2.2	−24 57.3		23 51.1	− 2 1.1	+0.0532	0.6060	+0.0697
λ Sagittarii	2.9	3.14	2.0	25 28.2	**27**	2 15.3	+ 0 17.2	+0.7429	0.6051	0.0768
24 Sagittarii	5.7	3.14	1.2	24 5.8		4 29.5	+ 2 25.7	−0.4467	0.6042	0.0834
117 B. Sagittarii	5.8	3.14	0.7	23 34.7		6 14.1	+ 4 6.0	−0.8137	0.6034	0.0885
26 Sagittarii	6.1	3.16	0.6	23 54.8		7 29.5	+ 5 18.2	−0.3664	0.6028	0.0921
126 B. Sagittarii	5.7	+3.19	− 0.6	−25 5.8		8 35.6	+ 6 21.7	+0.9167	0.6022	+0.0952
ν^1 Sagittarii	5.0	3.17	+ 0.6	22 50.9		12 10.0	+ 9 47.0	−0.9648	0.6004	0.1053
ν^2 Sagittarii	5.1	3.18	0.7	22 46.6		12 31.4	+10 7.7	−0.9989	0.6002	0.1063
154 B. Sagittarii	5.9	3.19	0.6	23 16.9		12 51.6	+10 27.0	−0.4600	0.6000	0.1073
168 B. Sagittarii	6.3	3.20	1.2	22 48.9		15 0.5	−11 29.3	−0.6892	0.5988	0.1131
191 B. Sagittarii	6.5	+3.23	+ 1.6	−23 19.4		17 43.5	− 8 53.0	+0.1356	0.5971	+0.1204
199 B. Sagittarii	6.4	3.21	2.2	21 47.9		19 10.7	− 7 29.3	−1.2071	0.5962	0.1243
222 B. Sagittarii	5.5	3.26	2.8	22 33.5		22 19.6	− 4 28.1	−0.0444	0.5942	0.1325
50 Sagittarii	5.5	3.26	3.4	21 56.6	**28**	0 32.6	− 2 20.5	−0.3590	0.5926	0.1380
253 B. Sagittarii	6.1	3.27	3.8	21 29.2		2 20.4	− 0 37.0	−0.5620	0.5913	0.1425
f Sagittarii	5.1	+3.28	+ 5.4	−19 57.7		8 27.7	+ 5 15.8	−1.1665	0.5869	+0.1570
σ Capricorni	5.5	3.40	8.3	19 22.8		21 48.9	− 5 53.9	+0.5409	0.5764	0.1853
π Capricorni	5.2	3.41	9.2	18 29.1	**29**	1 6.2	− 2 44.0	+0.2655	0.5738	0.1914
ρ Capricorni	5.0	3.40	9.4	18 5.4		1 44.9	− 2 6.7	−0.0068	0.5733	0.1926
ο Capricorni	5.6	3.43	9.2	18 51.6		2 10.2	− 1 42.3	+0.8458	0.5730	0.1934
47 B. Capricorni	6.2	+3.41	+10.3	−16 48.7		4 32.8	+ 0 34.9	−0.7406	0.5711	+0.1976
υ Capricorni	5.3	3.45	10.2	18 25.9		6 25.7	+ 2 23.7	+1.2583	0.5696	0.2008
61 B. Capricorni	5.9	3.41	10.9	16 25.2		6 39.7	+ 2 37.1	−0.7120	0.5694	0.2012
94 B. Capricorni	5.7	3.49	12.2	16 21.1		13 57.1	+ 9 38.6	+0.7286	0.5636	0.2127
95 B. Capricorni	5.9	3.45	12.8	14 48.3		14 24.7	+10 5.2	−0.7280	0.5633	0.2134
53 B. Aquarii	6.5	+3.50	+14.4	−13 32.8		21 56.4	− 6 39.3	−0.3483	0.5576	+0.2236
18 Aquarii	5.5	3.53	15.1	13 14.1	**30**	1 33.3	− 3 10.0	+0.1535	0.5550	0.2280
72 B. Aquarii	6.5	3.52	15.9	11 55.7		3 21.8	− 1 25.2	−0.7505	0.5537	0.2300
137 B. Capricorni	6.2	3.55	17.0	10 57.0		8 24.2	+ 3 26.7	−0.5656	0.5503	0.2353
c^2 Capricorni	6.3	3.56	17.8	9 39.6		11 29.4	+ 6 25.5	−1.1413	0.5483	0.2382
λ Capricorni	5.5	+3.60	+17.2	−11 44.9		11 35.5	+ 6 31.4	+0.9969	0.5482	+0.2383
96 B. Aquarii	6.5	+3.61	+18.0	−10 42.2		14 49.2	+ 9 38.5	+0.7123	0.5462	+0.2410

DECEMBER.

Name.	Mag.	Δα	Δδ	Apparent Declination.	d	h m	Hour Angle, H	Y	x'	y'
θ Aquarii	4.3	+3.69	+20.2	− 8 11.8	**1**	1 34.3	− 3 57.9	+0.8061	0.5402	+0.2484
ρ Aquarii	5.3	3.70	20.4	8 14.3		3 9.0	− 2 26.3	+1.2417	0.5394	0.2493
170 B. Aquarii	6.0	3.70	20.9	7 36.8		4 43.2	− 0 55.2	+0.9993	0.5386	0.2500
51 Aquarii	5.8	3.67	21.7	5 15.4		5 0.3	− 0 38.7	−1.3286	0.5385	0.2502
186 B. Aquarii	6.1	3.74	21.4	6 58.7		8 22.6	+ 2 37.0	+1.2715	0.5370	0.2517
κ Aquarii	5.2	+3.73	+22.6	− 4 39.3		11 27.3	+ 5 35.7	−0.3204	0.5357	+0.2528
207 B. Aquarii	6.3	3.74	23.0	3 59.1		12 54.2	+ 6 59.7	−0.6388	0.5350	0.2532
6 G. Piscium	6.2	3.82	24.2	2 50.3		21 15.6	− 8 54.9	+0.3134	0.5322	0.2550
22 B. Piscium	6.4	3.93	26.2	− 0 9.8	**2**	9 29.4	+ 2 55.7	+0.6890	0.5293	0.2548
κ Piscium	4.9	3.95	26.4	+ 0 48.2		11 8.7	+ 4 31.8	+0.1169	0.5290	0.2546
9 Piscium	6.4	+3.95	+26.5	+ 0 40.1		11 18.0	+ 4 40.9	+0.2948	0.5290	+0.2546
16 Piscium	5.7	3.98	27.2	1 38.6		15 45.7	+ 9 0.1	+0.4242	0.5285	0.2536
19 Piscium	5.4	4.04	27.8	3 1.7		20 38.5	−10 16.3	+0.2290	0.5281	0.2521
36 Piscium	6.2	4.20	29.7	7 46.9	**3**	11 23.1	+ 4 0.6	−1.0341	0.5283	0.2447
d Piscium	5.4	4.23	29.7	7 43.9		13 21.0	+ 5 54.9	−0.5028	0.5285	0.2434
136 B. Piscium	6.5	+4.36	+29.9	+ 8 54.3		23 22.8	− 8 22.4	+0.6788	0.5299	+0.2357

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

DECEMBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1916.0. Δα	Red'ns from 1916.0. Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle, *H*	*Y*	*x′*	*y′*	N.	S.
		s	″	° ′	d h m	h m				°	°
Piscium	6.3	+4.55	+30.6	+12 30.9	4 11 36.8	+ 3 28.5	−0.2868	0.5327	+0.2237	+26	−53
Piscium	3.7	4.73	30.4	14 55.3	23 30.2	− 9 1.1	−0.2429	0.5363	0.2093	+28	−49
Piscium	6.2	4.75	30.0	14 14.4	5 1 32.6	− 7 2.7	+0.8997	0.5370	0.2066	+90	+13
Piscium	6.1	4.81	30.3	15 59.3	3 22.5	− 5 16.3	−0.5687	0.5376	0.2042	+11	−68
Arietis	6.4	4.86	30.3	17 0.1	6 37.5	− 2 7.7	−0.9832	0.5387	0.1995	−14	−73
Arietis	5.8	+4.87	+30.0	+16 32.8	7 22.6	− 1 24.1	−0.3527	0.5390	+0.1984	+22	−54
Arietis	5.1	4.94	29.7	17 25.0	11 40.1	+ 2 45.0	−0.4360	0.5406	0.1920	+18	−58
B. Arietis	6.4	4.99	29.5	17 51.5	14 38.0	+ 5 37.0	−0.3423	0.5417	0.1874	+23	−52
B. Arietis	6.5	5.01	29.2	17 38.3	16 31.2	+ 7 26.5	+0.2423	0.5424	0.1844	+56	−20
H¹. Arietis	6.4	5.01	28.7	16 50.3	17 16.4	+ 8 10.1	+1.2287	0.5426	0.1832	+90	+42
Arietis	5.9	+5.06	+29.3	+19 6.8	17 49.9	+ 8 42.5	−1.0826	0.5429	+0.1823	−23	−71
Arietis	5.6	5.11	28.9	19 31.3	21 18.0	−11 56.2	−0.8954	0.5442	0.1765	− 9	−70
Arietis	6.2	5.19	28.0	19 29.5	6 3 3.0	− 6 22.8	+0.1221	0.5464	0.1665	+48	−24
Arietis	5.7	5.27	27.0	19 39.7	8 24.1	− 1 12.4	+0.8057	0.5484	0.1566	+90	+13
Arietis	5.8	5.38	25.8	20 20.4	15 30.3	+ 5 39.2	+1.1479	0.5510	0.1429	+90	+39
Arietis (*mean*)	4.6	+5.39	+25.9	+21 0.7	16 0.9	+ 6 8.8	+0.5014	0.5511	+0.1419	+75	− 2
Arietis	6.1	5.60	23.1	22 31.3	7 5 4.3	− 5 14.8	+0.5626	0.5554	0.1147	+81	+ 4
Tauri	5.9	5.68	22.8	24 11.4	7 42.8	− 2 41.9	−0.9361	0.5561	0.1089	−14	−66
Tauri	5.4	5.73	21.6	24 1.9	12 17.8	+ 1 43.6	−0.2912	0.5572	0.0987	+25	−39
Tauri	3.8	5.73	21.5	23 51.4	12 19.8	+ 1 45.5	−0.0983	0.5572	0.0986	+36	−29
Tauri	5.6	+5.75	+21.6	+24 35.0	12 26.8	+ 1 52.3	−0.8696	0.5572	+0.0984	− 9	−65
Tauri	4.3	5.74	21.6	24 12.6	12 28.3	+ 1 53.7	−0.4664	0.5572	0.0983	+15	−50
Tauri	4.1	5.74	21.5	24 6.7	12 44.8	+ 2 9.7	−0.3333	0.5573	0.0977	+23	−42
Tauri	5.8	5.75	21.5	24 17.9	12 46.8	+ 2 11.6	−0.5316	0.5573	0.0976	+12	−54
Tauri	6.5	5.75	21.5	24 16.4	12 50.5	+ 2 15.2	−0.4970	0.5573	0.0975	+14	−52
Tauri	4.3	+5.73	+21.4	+23 41.6	12 58.4	+ 2 22.8	+0.1400	0.5574	+0.0972	+50	−16
Tauri	3.0	5.74	21.2	23 51.1	13 28.9	+ 2 52.2	+0.0181	0.5575	0.0960	+42	−22
B. Tauri	5.5	5.72	21.1	23 10.2	13 52.3	+ 3 14.8	+0.7907	0.5576	0.0952	+90	+19
Tauri	3.7	5.74	21.1	23 48.2	14 13.4	+ 3 35.1	+0.1412	0.5576	0.0944	+50	−16
Tauri	5.2	5.75	21.1	23 53.2	14 13.9	+ 3 35.6	+0.0521	0.5576	0.0943	+45	−20
Tauri	5.6	+5.81	+19.3	+23 52.8	20 54.6	+10 2.3	+0.6382	0.5589	+0.0790	+90	+12
Tauri	5.3	5.94	17.1	25 26.2	8 4 52.3	− 6 16.9	−0.4899	0.5600	0.0603	+14	−48
Tauri	6.1	5.89	16.9	24 6.7	5 30.7	− 5 39.8	+0.9845	0.5600	0.0588	+90	+35
B. Tauri	6.3	5.99	12.6	24 27.7	19 37.1	+ 7 56.7	+1.1980	0.5602	0.0248	+88	+56
Tauri	5.6	6.02	12.3	24 55.5	20 26.3	+ 8 44.2	+0.7143	0.5602	+0.0228	+90	+22
Tauri	5.4	+6.07	+ 8.0	+25 5.1	9 10 5.9	− 2 5.0	+0.6284	0.5583	−0.0101	+89	+18
Tauri	5.1	6.12	6.4	25 51.2	14 42.3	+ 2 21.7	−0.2822	0.5572	0.0211	+25	−32
Tauri	5.0	6.06	5.2	24 32.5	18 50.6	+ 6 21.3	+1.0459	0.5561	0.0308	+90	+42
B. Tauri	5.8	6.04	4.1	24 14.4	22 22.5	+ 9 45.9	+1.2548	0.5550	0.0391	+77	+62
Tauri	4.7	6.13	3.8	25 56.7	22 49.0	+10 11.4	−0.6334	0.5549	0.0401	+ 5	−57
Geminorum	5.9	+6.05	+ 1.9	+24 26.4	10 4 54.8	− 7 55.4	+0.7313	0.5527	−0.0541	+90	+20
Geminorum	6.1	6.02	+ 1.3	23 59.9	7 4.4	− 5 50.2	+1.0950	0.5519	0.0590	+90	+43
B. Geminorum	6.5	6.03	− 1.9	24 39.7	16 40.2	+ 3 26.0	−0.3003	0.5477	0.0800	+24	−38
Geminorum	3.2	6.04	2.9	25 12.9	19 38.0	+ 6 17.8	−1.1572	0.5464	0.0863	−34	−65
B. Geminorum	5.8	5.96	3.9	23 42.1	23 23.4	+ 9 55.6	+0.1724	0.5445	0.0941	+52	−14
Geminorum	5.2	+5.96	− 5.4	+24 20.1	11 4 13.4	− 9 23.8	−1.0060	0.5420	−0.1039	−19	−66
Geminorum	5.9	5.88	5.7	22 45.8	5 36.3	− 8 3.6	+0.5841	0.5413	0.1066	+83	+ 6
Geminorum	3.5	5.81	7.6	22 8.2	12 36.7	− 1 16.9	+0.4827	0.5374	0.1200	+73	− 1
Geminorum	6.0	5.84	8.3	23 6.3	14 11.2	+ 0 14.5	−0.7809	0.5366	0.1230	− 3	−67
B. Geminorum	6.4	5.75	8.5	21 42.1	15 50.0	+ 1 50.1	+0.5661	0.5356	0.1260	+81	+ 3
Geminorum	5.3	+5.76	− 8.7	+21 36.9	16 15.3	+ 2 14.6	+0.6085	0.5354	−0.1268	+85	+ 5
B. D.+23° 1744	6.4	5.80	9.5	23 3.9	18 40.8	+ 4 35.5	−1.3077	0.5340	0.1311	−59	−65
Geminorum	6.3	5.65	10.8	20 30.9	12 0 40.9	+10 24.1	+0.6953	0.5306	0.1416	+90	+ 8
B. Geminorum	6.2	5.58	11.5	19 32.3	4 1.2	−10 21.9	+1.2968	0.5287	0.1471	+78	+56
Geminorum	5.2	5.60	12.1	20 6.2	5 50.2	− 8 36.3	+0.4006	0.5277	0.1501	+67	− 9
B. Geminorum	6.3	+5.57	−12.7	+20 2.6	8 22.3	− 6 8.9	+0.0809	0.5262	−0.1541	+46	−28

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

DECEMBER.

THE STAR'S					AT CONJUNCTION IN R. A.					Limi- ing Pa- allels.	
Name.	Mag.	Red'ns from 1916.0. Δα	Red'ns from 1916.0. Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle, *H*	*Y*	*x′*	*y′*	N.	S.
		s	″	° ′	d h m	h m				°	°
10 H. Cancri	6.1	+5.51	-13.0	+19 4.6	**12** 10 21.1	- 4 13.8	+0.8450	0.5251	-0.1572	+90	+15
SATURN	0.1	. . .	. . .	20 20.9	14 13.2	- 0 28.8	-1.1845	0.5256	0.1637	-33	-70
d^1 Cancri	5.9	5.41	15.2	18 35.9	19 42.0	+ 4 50.0	-0.1592	0.5200	0.1709	+33	-41
d^2 Cancri	6.2	5.34	15.3	17 19.2	20 58.6	+ 6 4.2	+1.0400	0.5193	0.1727	+90	+26
θ Cancri	5.5	5.36	16.2	18 22.5	23 53.5	+ 8 53.9	-0.6395	0.5177	0.1767	+ 7	-69
NEPTUNE	7.7	. . .	. . .	+18 54.1	**13** 0 5.1	+ 9 5.2	-1.2586	0.5184	-0.1771	-40	-71
54 Cancri	6.3	+5.17	-17.5	15 39.5	9 57.4	- 5 20.1	+0.5321	0.5126	0.1893	+76	-7
o^1 Cancri	5.1	5.15	18.3	15 38.4	13 11.9	- 2 11.2	-0.0683	0.5110	0.1930	+38	-39
o^2 Cancri	5.7	5.16	18.4	15 54.0	13 22.3	- 2 1.1	-0.3892	0.5109	0.1932	+21	-57
81 Cancri	6.4	5.02	19.6	15 19.8	21 9.8	+ 5 32.9	-1.2959	0.5074	0.2016	-42	-75
ξ Leonis	5.1	+4.84	-20.7	+11 40.0	**14** 7 41.8	- 8 13.1	+0.5891	0.5033	-0.2116	+80	-7
o Leonis	3.8	4.75	21.1	10 16.2	12 41.3	- 3 22.0	+1.0704	0.5017	0.2157	+90	+22
83 B. Leonis	5.9	4.65	22.0	9 19.5	21 1.0	+ 4 43.6	+0.2914	0.4993	0.2219	+58	-24
89 B. Leonis	6.2	4.63	22.0	8 42.6	21 56.6	+ 5 37.8	+0.7669	0.4991	0.2225	+90	+1
π Leonis	4.9	4.61	22.1	8 26.5	23 5.4	+ 6 44.6	+0.8072	0.4988	0.2233	+90	+4
43 Leonis	6.3	+4.46	-23.3	+ 6 57.8	**15** 11 38.5	- 5 3.1	-0.4105	0.4966	-0.2306	+20	-64
155 B. Leonis	6.5	4.43	23.0	6 6.9	11 47.3	- 4 54.6	+0.4916	0.4966	0.2306	+72	-15
35 Sextantis	6.1	4.32	23.8	5 10.9	22 53.7	+ 5 53.6	-1.0702	0.4959	0.2353	-18	-85
p^4 Leonis	5.7	4.13	24.1	2 24.3	**16** 11 56.3	- 5 25.2	-1.1129	0.4968	0.2388	-21	-88
p^5 Leonis	5.3	4.09	23.6	0 22.9	15 42.1	- 1 45.6	+0.2022	0.4973	0.2394	+53	-31
359 B. Leonis	6.3	+4.05	-24.1	+ 0 35.2	20 55.9	+ 3 19.4	-1.2745	0.4983	-0.2399	-36	-89
388 B. Leonis	6.3	4.01	23.6	- 1 14.6	23 26.9	+ 5 46.3	+0.1180	0.4989	0.2399	+48	-35
e Leonis	5.1	3.99	23.2	2 32.8	**17** 0 46.1	+ 7 3.2	+1.2192	0.4992	0.2400	+87	+30
431 B. Leonis	6.2	3.95	23.6	1 58.7	5 9.9	+11 19.6	-0.4544	0.5005	0.2398	+18	-69
13 B. Virginis	5.9	3.88	23.0	4 52.3	11 59.2	- 6 2.5	+1.0512	0.5029	0.2391	+85	+17
64 B. Virginis	6.5	+3.78	-22.5	- 7 18.8	22 19.2	+ 3 59.8	+1.2225	0.5074	-0.2367	+83	+31
q Virginis	5.3	3.68	22.2	8 59.7	**18** 10 27.7	- 8 13.0	+0.1787	0.5142	0.2316	+49	-32
370 B. Virginis	6.0	3.60	21.5	11 12.0	20 51.6	+ 1 52.1	+0.1531	0.5212	0.2251	+47	-33
69 Virginis	4.9	3.50	19.6	15 32.6	**19** 13 0.6	- 6 29.3	+1.2154	0.5342	0.2108	+74	+33
75 Virginis	5.6	3.49	19.8	14 56.2	15 34.5	- 4 0.3	+0.0387	0.5364	0.2080	+38	-40
83 Virginis	5.6	+3.46	-19.3	-15 45.7	21 0.7	+ 1 15.2	-0.2083	0.5414	-0.2015	+24	-54
85 Virginis	6.1	3.46	19.4	15 21.1	21 31.2	+ 1 44.6	-0.7409	0.5418	0.2009	- 5	-90
87 Virginis	5.8	3.47	18.7	17 26.7	22 21.0	+ 2 32.8	+1.2830	0.5426	0.1998	+73	+42
89 Virginis	5.1	3.45	18.6	17 43.3	23 29.0	+ 3 38.5	+1.3452	0.5437	0.1984	+69	+56
43 H. Virginis	5.5	3.40	17.8	17 48.9	**20** 10 59.4	- 9 14.7	-0.7499	0.5549	0.1817	- 8	-90
231 G. Virginis	6.4	+3.40	-17.6	-18 12.0	11 43.1	- 8 32.6	-0.4813	0.5556	-0.1805	+ 7	-72
236 G. Virginis	5.7	3.39	17.6	18 19.9	12 24.7	- 7 52.4	-0.4695	0.5563	0.1794	+ 8	-71
9 G. Libræ	6.5	3.38	16.5	20 4.5	19 26.0	- 1 6.2	+0.1161	0.5634	0.1672	+36	-35
17 G. Libræ	6.4	3.36	16.0	20 49.5	**21** 0 15.0	+ 3 32.4	+0.1030	0.5682	0.1581	+35	-36
18 G. Libræ	6.1	3.36	15.8	20 58.6	0 41.2	+ 3 57.7	+0.1908	0.5686	0.1572	+39	-31
43 B. Libræ	5.7	+3.42	-17.1	-21 2.6	4 55.5	+ 8 2.6	-0.3904	0.5729	-0.1487	+ 8	-66
47 G. Libræ	6.1	3.35	14.8	21 42.6	8 39.9	+11 38.5	-0.2481	0.5766	0.1406	+15	-56
64 G. Libræ	5.8	3.33	14.2	22 5.6	12 42.5	- 8 28.1	-0.4066	0.5805	0.1316	+ 5	-67
153 B. Libræ	6.3	3.45	13.0	24 12.5	19 23.6	- 2 2.5	+0.9163	0.5868	0.1156	+66	+12
169 B. Libræ	6.0	3.32	13.0	22 52.0	21 14.9	- 0 15.6	-0.6542	0.5885	0.1110	-10	-90
177 B. Libræ	6.2	+3.32	-12.9	-22 52.8	21 51.6	+ 0 19.6	-0.7087	0.5890	-0.1095	-13	-90
42 Libræ	5.0	3.33	12.7	23 33.0	22 12.9	+ 0 40.0	-0.0689	0.5894	0.1086	+20	-46
A Scorpii	4.6	3.34	11.7	25 4.8	**22** 3 23.6	+ 5 38.4	+0.9505	0.5938	0.0950	+65	+15
31 B. Scorpii	5.4	3.32	11.8	24 17.2	3 30.9	+ 5 45.4	+0.1380	0.5939	0.0947	+30	-34
32 B. Scorpii	5.3	3.31	11.9	23 43.9	3 32.1	+ 5 46.5	-0.4245	0.5939	0.0947	+ 1	-69
3 Scorpii	5.9	+3.34	-11.7	-24 59.9	3 48.0	+ 6 1.7	+0.8296	0.5942	-0.0940	+65	+ 7
40 B. Scorpii	5.4	3.32	11.5	24 35.6	5 19.1	+ 7 29.2	+0.2800	0.5954	0.0899	+37	-26
48 B. Scorpii	4.9	3.34	11.1	25 38.1	7 8.3	+ 9 14.0	+1.1707	0.5969	0.0849	+64	+36
50 B. Scorpii	6.4	3.32	11.2	24 29.9	7 22.1	+ 9 27.2	+0.0062	0.5970	0.0843	+22	-41
57 B. Scorpii	5.7	+3.30	-11.2	-23 22.9	8 13.3	+10 16.4	-1.1900	0.5977	-0.0819	-50	-90
				NEW	*MOON.*						

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

DECEMBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1916.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	″	° ′	d h m	h m				°	°
π Capricorni	5.2	+3.30	+ 9.0	–18 29.1	26 9 54.6	+ 7 52.2	+0.3575	0.5847	+0.1961	+52	–22
ρ Capricorni	5.0	3.29	9.2	18 5.4	10 32.1	+ 8 28.3	+0.0904	0.5842	0.1973	+37	–36
o Capricorni	5.6	3.31	9.1	18 51.6	10 56.5	+ 8 51.8	+0.9293	0.5838	0.1981	+71	+11
47 B. Capricorni	6.2	3.28	9.9	16 48.7	13 14.2	+11 4.2	–0.6280	0.5820	0.2024	0	–85
υ Capricorni	5.3	3.32	10.0	18 25.9	15 3.1	–11 11.1	+1.3393	0.5805	0.2056	+69	+55
61 B. Capricorni	5.9	+3.28	+10.5	–16 25.2	15 16.6	–10 58.1	–0.5977	0.5803	+0.2060	+ 2	–82
94 B. Capricorni	5.7	3.32	11.7	16 21.1	22 18.7	– 4 12.0	+0.8261	0.5746	0.2177	+74	+ 4
95 B. Capricorni	5.9	3.29	12.1	14 48.3	22 45.4	– 3 46.4	–0.6054	0.5742	0.2184	+ 4	–82
53 B. Aquarii	6.5	3.31	13.6	13 32.8	27 6 1.2	+ 3 13.3	–0.2252	0.5684	0.2287	+25	–54
18 Aquarii	5.5	3.33	14.2	13 14.1	9 30.5	+ 6 34.9	+0.2714	0.5657	0.2331	+52	–27
72 B. Aquarii	6.5	+3.31	+14.8	–11 55.7	11 15.2	+ 8 15.8	–0.6159	0.5643	+0.2351	+ 5	–83
137 B. Capricorni	6.2	3.33	15.8	10 57.1	16 7.2	–11 2.7	–0.4303	0.5606	0.2403	+16	–67
c^1 Capricorni	5.3	3.33	16.6	9 27.8	18 32.9	– 8 42.2	–1.3229	0.5589	0.2427	–46	–84
c^2 Capricorni	6.3	3.34	16.6	9 39.6	19 6.0	– 8 10.2	–0.9944	0.5585	0.2432	–16	–90
λ Capricorni	5.5	3.37	16.1	11 45.0	19 11.9	– 8 4.5	+1.1086	0.5584	0.2433	+78	+22
96 B. Aquarii	6.5	+3.38	+16.8	–10 42.2	22 19.0	– 5 4.0	+0.8310	0.5562	+0.2460	+79	+ 3
θ Aquarii	4.3	3.43	18.8	8 11.8	28 8 43.0	+ 4 58.4	+0.9302	0.5494	0.2530	+82	+ 9
ρ Aquarii	5.3	3.44	19.0	8 14.3	10 14.7	+ 6 27.1	+1.3599	0.5485	0.2538	+78	+48
170 B. Aquarii	6.0	3.44	19.4	7 36.8	11 46.0	+ 7 55.2	+1.1221	0.5476	0.2545	+82	+22
51 Aquarii	5.8	3.41	20.1	5 15.4	12 2.6	+ 8 11.3	–1.1702	0.5475	0.2547	–27	–90
186 B. Aquarii	6.1	+3.48	+19.9	– 6 58.7	15 18.7	+11 20.7	+1.3922	0.5456	+0.2560	+72	+55
κ Aquarii	5.2	3.46	20.9	4 39.3	18 17.9	– 9 46.1	–0.1750	0.5440	0.2570	+32	–51
207 B. Aquarii	6.3	3.47	21.4	3 59.1	19 42.2	– 8 24.6	–0.4884	0.5434	0.2573	+16	–71
6 G. Piscium	6.2	3.54	22.4	2 50.3	29 3 49.7	– 0 33.3	+0.4527	0.5396	0.2586	+68	–18
22 B. Piscium	6.4	3.65	24.4	– 0 9.8	15 45.2	+10 58.9	+0.8256	0.5353	0.2577	+90	+ 2
κ Piscium	4.9	+3.66	+24.6	+ 0 48.1	17 22.3	–11 27.1	+0.2602	0.5349	+0.2573	+56	–28
9 Piscium	6.4	3.66	24.7	0 40.1	17 31.3	–11 18.4	+0.4360	0.5348	0.2573	+67	–19
16 Piscium	5.7	3.69	25.4	1 38.6	21 53.3	– 7 4.9	+0.5640	0.5337	0.2560	+77	–12
19 Piscium	5.4	3.75	26.0	3 1.7	30 2 40.4	– 2 27.0	+0.3705	0.5328	0.2541	+63	–22
36 Piscium	6.2	3.92	28.1	7 46.9	17 10.6	+11 35.5	–0.8863	0.5312	0.2457	– 6	–82
d Piscium	5.4	+3.95	+28.1	+ 7 43.9	19 7.0	–10 31.8	–0.3598	0.5312	+0.2443	+23	–61
136 B. Piscium	6.5	4.09	28.4	8 54.3	31 5 2.3	– 0 55.5	+0.8098	0.5314	0.2359	+90	+ 4
58 Piscium	5.7	4.15	29.3	11 31.4	7 49.4	+ 1 46.3	–1.2600	0.5316	0.2332	–36	–78
75 Piscium	6.3	+4.29	+29.4	+12 30.9	17 11.4	+10 50.3	–0.1579	0.5328	+0.2231	+33	–46

OCCULTATIONS VISIBLE AT WASHINGTON.

Date.	The Star's		Immersion.				Emersion.				Duration of Occultation.
			Washington.		Angle from—		Washington.		Angle from—		
	Name.	Mag.	Sidereal Time.	Mean Time.	North Point.	Vertex.	Sidereal Time.	Mean Time.	North Point.	Vertex.	
			h m	h m	°	°	h m	h m	°	°	h m
Jan. 14	q Tauri	4.3	9 40	14 6	95	41	10 38	15 4	260	210	0 58
14	16 Tauri	5.4	9 41	14 8	145	91	10 13	14 39	210	158	0 32
14	21 Tauri	5.8	10 0	14 26	76	24	10 55	15 22	279	231	0 55
14	20 Tauri	4.1	10 1	14 28	121	69	10 48	15 14	234	185	0 47
14	22 Tauri	6.5	10 3	14 30	83	30	10 59	15 26	273	225	0 56
15	χ Tauri	5.3	0 26	4 50	132	192	1 3	5 27	191	251	0 37
18	48 Geminorum	5.8	7 26	11 37	126	111	8 52	13 3	276	224	1 26

Note.—The angles of position are counted from the north point and vertex of the Moon's limb toward the east.

OCCULTATIONS VISIBLE AT WASHINGTON.

Date.	The Star's		Immersion.				Emersion.				Duration of Occultation.
			Washington.		Angle from—		Washington.		Angle from—		
	Name.	Mag.	Sidereal Time.	Mean Time.	North Point.	Vertex.	Sidereal Time.	Mean Time.	North Point.	Vertex.	
			h m	h m	°	°	h m	h m	°	°	h m
Jan. 18	58 Geminorum ‡	6.0	14 12	18 22	164	115	14 41	18 51	232	186	0 29
23	p^4 Leonis †	5.7	4 45	8 36	114	166	5 44	9 36	299	350	0 59
26	87 Virginis	5.8	16 12	19 50	165	134	17 1	20 39	245	206	0 49
29	134 B. Scorpii	6.4	14 27	17 53	71	98	15 32	18 59	313	328	1 6
30	*X* Sagitt. (*var.*) †	4.4	13 11	16 34	118	164	14 10	17 33	256	295	0 59
31	σ Sagittarii †	2.1	14 3	17 21	143	191	14 38	17 57	213	257	0 36
Feb. 14	ε Geminorum	3.2	1 47	4 13	154	213	2 17	4 42	205	264	0 30
14	ω Geminorum	5.2	12 58	15 22	116	62	13 53	16 17	280	231	0 55
15	B. D.+23° 1744	6.4	0 25	2 47	119	168	1 18	3 39	251	304	0 52
15	192 B. Geminorum	6.3	6 34	8 54	141	179	7 53	10 14	260	251	1 19
17	π Cancri	5.6	2 38	4 52	114	165	3 37	5 51	280	333	0 59
21	*q* Virginis	5.3	10 37	12 34	175	202	11 29	13 26	261	277	0 52
27	69 G. Sagittarii †	6.3	13 30	15 2	60	109	14 24	15 56	303	346	0 54
Mar. 7	47 B. Arietis	6.5	7 7	8 5	103	48	8 2	9 0	328	275	0 55
11	112 B. Aurigæ	5.7	6 41	7 24	28	342	7 14	7 57	346	292	0 33
16	18 Leonis	5.8	4 31	4 54	83	136	5 30	5 53	324	17	0 59
16	19 Leonis	6.4	5 10	5 33	112	165	6 22	6 45	299	349	1 12
16	*R* Leonis (*var.*)	5–10	5 25	5 48	138	190	6 32	6 55	273	323	1 7
18	359 B. Leonis	6.3	6 54	7 9	60	109	7 26	7 40	5	52	0 31
23	π Scorpii	3.0	12 14	12 9	162	202	12 56	12 50	240	274	0 42
23	65 B. Scorpii	5.5	17 0	16 54	64	51	18 7	18 1	312	287	1 7
24	95 G. Ophiuchi	6.1	17 23	17 13	101	98	18 44	18 33	258	238	1 20
25	66 B. Sagittarii	4.7	18 19	18 5	73	71	19 40	19 26	266	247	1 21
26	ψ Sagittarii	4.9	15 53	15 36	154	191	16 16	15 59	191	224	0 23
Apr. 6	χ Tauri	5.3	7 31	6 31	91	30	8 45	7 46	270	211	1 14
9	ω Geminorum	5.2	7 26	6 14	128	106	8 52	7 40	271	218	1 25
13	43 Leonis	6.3	13 14	11 46	154	110	14 17	12 48	276	225	1 2
16	370 B. Virginis	6.0	17 46	16 6	35	346	17 59	16 19	10	320	0 13
17	75 Virginis	5.6	8 30	6 47	111	160	9 30	7 46	309	353	0 59
19	153 B. Libræ †	6.3	10 36	8 45	107	156	11 36	9 44	297	339	1 0
19	*b* Scorpii ‡	4.7	20 4	18 11	135	90	20 50	18 57	232	182	0 46
24	19 Capricorni	5.7	15 56	13 44	113	162	16 46	14 34	211	255	0 50
May 8	θ Cancri	5.5	13 50	10 43	66	11	14 28	11 21	345	292	0 37
19	86 B. Sagittarii	6.5	14 39	10 49	158	199	15 4	11 14	202	239	0 25
20	53 Sagittarii	6.3	17 48	13 53	121	144	18 40	14 45	204	216	0 52
20	274 B. Sagittarii	6.1	18 1	14 6	129	149	18 44	14 49	195	206	0 43
June 8	p^5 Leonis	5.3	12 22	7 14	148	126	13 38	8 30	288	251	1 16
11	87 Virginis	5.8	17 38	12 18	187	144	17 54	12 34	213	168	0 16
13	*b* Scorpii	4.7	19 17	13 48	129	90	20 11	14 42	238	192	0 54
16	172 B. Sagittarii	5.8	14 11	8 31	53	101	15 3	9 23	299	341	0 52
16	189 B. Sagittarii †	6.1	16 54	11 13	44	70	17 56	12 15	294	309	1 2
16	208 B. Sagittarii	6.1	20 50	15 8	47	26	21 55	16 14	269	237	1 6
18	29 Capricorni	5.5	19 45	13 56	50	69	21 1	15 12	249	251	1 16
21	22 Piscium	5.8	20 51	14 50	132	174	21 6	15 5	155	196	0 15
22	136 B. Piscium	6.5	21 52	15 47	18	62	22 52	16 47	270	305	1 0
July 16	96 B. Aquarii	6.5	2 8	18 29	339	292	2 20	18 40	318	270	0 11
23	17 Tauri	3.8	21 40	13 34	25	79	22 21	14 14	297	353	0 40
23	23 Tauri	4.3	22 3	13 56	90	145	23 1	14 54	230	289	0 58
23	η Tauri	3.0	22 38	14 30	76	133	23 43	15 36	243	302	1 5
23	28 Tauri	5.2	23 30	15 23	101	160	0 31	16 23	216	275	1 1
23	27 Tauri	3.7	23 36	15 29	126	184	0 16	16 8	192	250	0 39
Aug. 7	*b* Scorpii	4.7	16 11	7 7	115	109	17 32	8 27	268	246	1 20
10	127 G. Sagittarii †	6.4	14 4	4 48	61	109	15 0	5 44	292	334	0 56

NOTE.—The angles of position are counted from the north point and vertex of the Moon's limb toward the east.
† *Immersion below* the horizon of Washington. ‡ Emersion below the horizon of Washington.

OCCULTATIONS VISIBLE AT WASHINGTON.

Date.	The Star's		IMMERSION.				EMERSION.				Duration of Occultation.
			Washington.		Angle from—		Washington.		Angle from—		
	Name.	Mag.	Sidereal Time.	Mean Time.	North Point.	Vertex.	Sidereal Time.	Mean Time.	North Point.	Vertex.	
			h m	h m	°	°	h m	h m	°	°	h m
Aug. 10	172 B. Sagittarii	5.8	15 2	5 46	44	86	15 54	6 38	305	340	0 52
10	189 B. Sagittarii	6.1	17 55	8 38	48	63	19 6	9 49	282	281	1 10
10	208 B. Sagittarii	6.1	21 48	12 30	69	38	22 53	13 35	246	205	1 5
12	29 Capricorni	5.5	20 12	10 47	61	75	21 27	12 2	235	231	1 15
13	*ρ* Aquarii	5.3	1 27	15 57	106	66	2 8	16 38	188	143	0 40
13	170 B. Aquarii ‡	6.0	3 14	17 44	84	34	4 5	18 34	218	167	0 50
15	22 Piscium †	5.8	17 13	7 37	93	144	18 0	8 24	213	265	0 47
17	101 Piscium †	6.2	18 31	8 46	75	124	19 22	9 38	235	287	0 51
24	SATURN	0.4	1 16	15 3	104	155	2 18	16 5	272	327	1 1
Sept. 4	116 B. Scorpii	6.2	15 55	5 1	54	60	16 55	6 0	323	317	1 0
9	96 B. Aquarii	6.5	2 25	15 9	356	309	2 51	15 35	302	253	0 26
15	*ε* Arietis (*mean*)	4.6	19 55	8 16	40	90	20 40	9 2	298	331	0 46
18	139 Tauri	4.7	4 37	16 45	19	66	5 5	17 13	344	20	0 28
21	d^1 Cancri †	5.9	0 57	12 54	146	193	1 36	13 33	236	286	0 39
Oct. 5	*o* Capricorni	5.6	23 10	10 12	5	332	23 48	10 50	296	257	0 39
6	29 Capricorni	5.5	16 15	3 15	94	143	17 15	4 14	225	269	0 59
7	*ρ* Aquarii	5.3	23 2	9 56	82	70	0 6	11 1	204	178	1 4
7	170 B. Aquarii	6.0	1 19	12 13	79	40	2 19	13 13	214	169	1 0
12	*μ* Arietis	5.7	23 48	10 23	127	181	0 20	10 54	177	227	0 32
13	66 Arietis †	6.1	19 59	6 30	28	75	20 35	7 6	297	347	0 36
13	17 Tauri	3.8	4 58	15 28	27	343	5 50	16 20	312	258	0 52
13	23 Tauri	4.3	5 32	16 2	84	32	6 54	17 23	262	203	1 22
13	*η* Tauri	3.0	6 22	16 52	56	358	7 30	17 59	294	235	1 7
13	27 Tauri	3.7	7 15	17 45	76	17	8 25	18 54	278	220	1 9
13	28 Tauri	5.2	7 21	17 50	56	357	8 22	18 51	297	239	1 1
19	o^2 Cancri	5.7	4 11	14 17	85	140	5 19	15 25	314	7	1 8
19	o^1 Cancri	5.1	4 19	14 26	152	206	5 13	15 19	246	299	0 54
Nov. 4	6 G. Piscium	6.2	2 44	11 48	4	318	3 23	12 26	292	244	0 38
6	136 B. Piscium	6.5	3 58	12 54	115	66	4 41	13 37	193	142	0 43
8	20 H^1. Arietis †	6.4	18 47	3 37	112	160	19 24	4 13	204	254	0 36
8	26 Arietis	6.2	7 34	16 22	7	312	7 54	16 41	330	276	0 20
9	66 Arietis	6.1	8 55	17 38	111	55	9 48	18 31	241	189	0 53
10	36 Tauri	5.6	21 49	6 30	68	121	22 47	7 27	258	315	0 57
11	*k* Tauri †	5.6	21 19	5 56	92	188	22 10	6 47	248	299	0 51
13	87 B. Geminorum	5.8	0 15	8 44	58	109	1 5	9 33	304	359	0 50
14	85 Geminorum	5.2	8 46	17 9	148	118	10 0	18 24	266	216	1 15
16	*ξ* Leonis	5.1	10 57	19 12	158	125	12 7	20 22	274	227	1 10
Dec. 2	22 B. Piscium	6.4	19 49	3 4	13	58	20 39	3 53	282	321	0 50
2	16 Piscium	5.7	4 18	11 32	98	47	5 7	12 20	209	158	0 49
5	47 B. Arietis	6.5	4 52	11 53	72	20	6 7	13 8	252	196	1 15
6	*ε* Arietis (*mean*)	4.6	3 58	10 55	136	101	4 37	11 34	190	144	0 39
7	27 Tauri	3.7	1 15	8 9	10	66	1 54	8 48	310	2	0 39
7	36 Tauri	5.6	9 54	16 46	124	70	10 41	17 34	236	186	0 47
8	*k* Tauri	5.6	9 46	16 35	174	117	10 0	16 49	199	142	0 14
11	149 B. Geminorum	6.4	2 33	9 12	166	223	2 58	9 36	207	264	0 24
11	79 Geminorum	6.3	13 54	20 31	80	28	14 41	21 17	320	271	0 47
14	83 B. Leonis	5.9	8 17	14 42	102	134	9 38	16 3	330	336	1 21
14	89 B. Leonis	6.2	10 26	16 51	161	149	11 38	18 3	274	239	1 12
14	*π* Leonis	4.9	11 58	18 22	136	98	13 15	19 39	295	247	1 17
16	*e* Leonis	5.1	14 37	20 54	191	150	15 6	21 22	235	190	0 29
18	370 B. Virginis	6.0	7 33	13 43	82	132	8 23	14 32	338	25	0 49
26	*π* Capricorni	5.2	23 55	5 35	34	354	0 49	6 28	270	224	0 54
27	18 Aquarii	5.5	23 43	5 19	343	312	0 3	5 39	310	276	0 20

NOTE.—The angles of position are counted from the north point and vertex of the Moon's limb toward the east.
† Immersion below the horizon of Washington. ‡ Emersion below the horizon of Washington.

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE SUN.

FOR GREENWICH MEAN NOON.

Date.	P	B_0	L_0	Date.	P	B_0	L_0
	°	°	°		°	°	°
Jan. 1	+ 2.37	−3.08	313.50	July 4	− 1.22	+3.35	31.75
6	− 0.07	3.65	247.65	9	+ 1.05	3.87	325.58
11	2.49	4.19	181.81	14	3.31	4.36	259.41
16	4.87	4.70	115.97	19	5.52	4.83	193.25
21	7.19	5.17	50.13	24	7.68	5.26	127.10
26	− 9.43	−5.60	344.30	29	+ 9.77	+5.66	60.96
31	11.57	5.98	278.47	Aug. 3	11.77	6.02	354.84
Feb. 5	13.60	6.32	212.64	8	13.68	6.34	288.72
10	15.51	6.61	146.80	13	15.49	6.61	222.62
15	17.28	6.85	80.96	18	17.18	6.84	156.53
20	−18.92	−7.03	15.12	23	+18.75	+7.02	90.46
25	20.41	7.16	309.27	28	20.20	7.14	24.40
Mar. 1	21.74	7.23	243.41	Sept. 2	21.51	7.22	318.35
6	22.92	7.25	177.54	7	22.68	7.25	252.32
11	23.93	7.21	111.65	12	23.70	7.22	186.30
16	−24.78	−7.12	45.75	17	+24.57	+7.15	120.28
21	25.45	6.97	339.83	22	25.28	7.02	54.29
26	25.95	6.77	273.89	27	25.82	6.84	348.30
31	26.28	6.52	207.94	Oct. 2	26.20	6.60	282.32
Apr. 5	26.42	6.22	141.97	7	26.40	6.32	216.36
10	−26.39	−5.88	75.98	12	+26.42	+5.99	150.39
15	26.16	5.50	9.96	17	26.25	5.61	84.44
20	25.76	5.08	303.93	22	25.89	5.20	18.50
25	25.17	4.62	237.87	27	25.33	4.74	312.56
30	24.40	4.13	171.80	Nov. 1	24.58	4.24	246.63
May 5	−23.44	−3.61	105.71	6	+23.63	+3.71	180.70
10	22.31	3.07	39.60	11	22.49	3.15	114.78
15	21.01	2.51	333.47	16	21.15	2.57	48.86
20	19.54	1.93	267.33	21	19.62	1.96	342.96
25	17.92	1.34	201.18	26	17.92	1.34	277.06
30	−16.16	−0.74	135.02	Dec. 1	+16.06	+0.71	211.17
June 4	14.27	−0.14	68.84	6	14.04	+0.07	145.28
9	12.27	+0.47	2.67	11	11.90	−0.57	79.39
14	10.17	1.06	296.48	16	9.65	1.21	13.52
19	8.00	1.66	230.30	21	7.31	1.84	307.65
24	− 5.77	+2.24	164.11	26	+ 4.91	−2.45	241.79
29	− 3.50	+2.80	97.93	31	+ 2.48	−3.05	175.94

In the above table, P is the position-angle of the axis of rotation measured eastward from the north point of the disk, while L_0 and B_0 are the heliographic longitudes and latitudes, respectively, of the center of the disk. The longitudes are reckoned from the Solar Meridian which passed through the ascending node of the Sun's equator on the ecliptic, on Jan. 1, 1854, Greenwich Mean Noon.

MEAN EQUATOR, ORBIT, AND MEAN LONGITUDE.

FOR GREENWICH MEAN NOON.

Date.	Mean Equator.			Orbit.		Mean Longitude.
	i	Δ	☊′	Γ'	☊	☾
	° ′	° ′	° ′	° ′	° ′	° ′
Jan. 1	22 30.0	126 52.8	3 5.2	265 22.3	309 43.0	233 18.6
11	22 30.7	126 19.8	3 6.5	266 29.2	309 11.3	5 4.4
21	22 31.4	125 46.8	3 7.8	267 36.0	308 39.5	136 50.3
31	22 32.1	125 13.9	3 9.1	268 42.8	308 7.7	268 36.1
Feb. 10	22 32.8	124 41.0	3 10.4	269 49.7	307 36.0	40 22.0
20	22 33.5	124 8.0	3 11.6	270 56.5	307 4.2	172 7.8
Mar. 1	22 34.2	123 35.1	3 12.9	272 3.4	306 32.4	303 53.6
11	22 34.9	123 2.2	3 14.1	273 10.2	306 0.6	75 39.5
21	22 35.6	122 29.4	3 15.3	274 17.0	305 28.9	207 25.3
31	22 36.3	121 56.5	3 16.5	275 23.9	304 57.1	339 11.1
Apr. 10	22 37.0	121 23.7	3 17.6	276 30.8	304 25.3	110 57.0
20	22 37.8	120 50.8	3 18.8	277 37.6	303 53.5	242 42.8
30	22 38.5	120 18.0	3 19.9	278 44.4	303 21.7	14 28.7
May 10	22 39.2	119 45.3	3 21.0	279 51.3	302 50.0	146 14.5
20	22 40.0	119 12.5	3 22.1	280 58.1	302 18.2	278 0.3
30	22 40.7	118 39.8	3 23.2	282 4.9	301 46.5	49 46.2
June 9	22 41.5	118 7.0	3 24.2	283 11.8	301 14.7	181 32.0
19	22 42.2	117 34.3	3 25.2	284 18.6	300 42.9	313 17.8
29	22 43.0	117 1.6	3 26.2	285 25.5	300 11.1	85 3.7
July 9	22 43.7	116 29.0	3 27.2	286 32.3	299 39.4	216 49.5
19	22 44.5	115 56.3	3 28.2	287 39.2	299 7.6	348 35.4
29	22 45.2	115 23.7	3 29.2	288 46.0	298 35.8	120 21.2
Aug. 8	22 46.0	114 51.1	3 30.1	289 52.8	298 4.1	252 7.0
18	22 46.8	114 18.5	3 31.0	290 59.7	297 32.3	23 52.9
28	22 47.6	113 45.9	3 31.9	292 6.5	297 0.5	155 38.7
Sept. 7	22 48.4	113 13.3	3 32.8	293 13.3	296 28.7	287 24.5
17	22 49.1	112 40.7	3 33.6	294 20.2	295 57.0	59 10.4
27	22 49.9	112 8.2	3 34.5	295 27.1	295 25.2	190 56.2
Oct. 7	22 50.7	111 35.7	3 35.3	296 33.9	294 53.4	322 42.1
17	22 51.5	111 3.2	3 36.1	297 40.7	294 21.6	94 27.9
27	22 52.3	110 30.7	3 36.9	298 47.6	293 49.9	226 13.7
Nov. 6	22 53.1	109 58.2	3 37.6	299 54.4	293 18.1	357 59.6
16	22 53.9	109 25.8	3 38.4	301 1.2	292 46.3	129 45.4
26	22 54.7	108 53.4	3 39.1	302 8.1	292 14.5	261 31.3
Dec. 6	22 55.5	108 21.0	3 39.8	303 15.0	291 42.8	33 17.1
16	22 56.3	107 48.6	3 40.5	304 21.8	291 11.0	165 2.9
26	22 57.1	107 16.3	3 41.1	305 28.6	290 39.2	296 48.8
36	22 57.9	106 43.9	3 41.8	306 35.5	290 7.5	68 34.6

Mean Solar Days.	Motion in Mean Longitude.
	° ′
0.1	1 19.06
0.2	2 38.12
0.3	3 57.18
0.4	5 16.23
0.5	6 35.29
0.6	7 54.35
0.7	9 13.41
0.8	10 32.47
0.9	11 51.53
1.0	13 10.58
2.0	26 21.17
3.0	39 31.75
4.0	52 42.33
5.0	65 52.92
6.0	79 3.50
7.0	92 14.09
8.0	105 24.67
9.0	118 35.25
10.0	131 45.84
Hours.	° ′
1	0 32.94
2	1 5.88
3	1 38.82
4	2 11.76
5	2 44.70
6	3 17.65
7	3 50.59
8	4 23.53
9	4 56.47
10	5 29.41
11	6 2.35
12	6 35.29
13	7 8.23
14	7 41.17
15	8 14.11
16	8 47.06
17	9 20.00
18	9 52.94
19	10 25.88
20	10 58.82
21	11 31.76
22	12 4.70
23	12 37.64

Daily motion of Γ' . . . . $+6'.684$
Daily motion of ☊ . . . . $-3'.177$

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE MOON.

FOR GREENWICH MEAN MIDNIGHT.

Date.		The Earth's Selenographic—		Physical Libration.		The Sun's Selenographic—		C
		Long.	Lat.	Long.	Lat.	Colong.	Lat.	
		°	°	°	°	°	°	°
Jan.	1	−4.63	+6.45	0.00	−0.03	229.52	−0.73	14.78
	2	2.86	5.74	0.00	0.03	241.71	0.70	9.45
	3	−0.88	4.62	0.00	0.03	253.90	0.67	3.19
	4	+1.15	3.16	0.00	0.03	266.09	0.65	356.71
	5	3.08	+1.48	0.00	0.03	278.28	0.62	350.76
	6	+4.74	−0.28	+0.01	−0.03	290.47	−0.60	345.79
	7	6.05	1.97	0.01	0.03	302.65	0.57	342.03
	8	6.92	3.50	0.01	0.03	314.84	0.55	339.37
	9	7.36	4.78	0.01	0.03	327.01	0.53	337.84
	10	7.37	5.77	0.01	0.03	339.18	0.51	337.35
	11	+7.00	−6.43	+0.01	−0.03	351.35	−0.49	337.86
	12	6.31	6.78	0.01	0.03	3.50	0.47	339.36
	13	5.37	6.81	+0.01	0.03	15.66	0.45	341.83
	14	4.23	6.54	0.00	0.03	27.80	0.43	345.22
	15	2.97	5.99	0.00	0.03	39.95	0.41	349.40
	16	+1.64	−5.18	0.00	−0.03	52.09	−0.38	354.15
	17	+0.28	4.16	0.00	0.03	64.22	0.36	359.19
	18	−1.05	2.96	0.00	0.03	76.35	0.33	4.19
	19	2.32	1.62	0.00	0.03	88.48	0.30	8.87
	20	3.49	−0.20	0.00	0.03	100.61	0.27	13.02
	21	−4.53	+1.25	0.00	−0.03	112.74	−0.24	16.51
	22	5.40	2.66	0.00	0.03	124.88	0.20	19.27
	23	6.07	3.96	0.00	0.03	137.01	0.17	21.24
	24	6.50	5.09	−0.01	0.03	149.15	0.14	22.39
	25	6.67	5.97	0.01	0.03	161.30	0.10	22.60
	26	−6.53	+6.56	−0.01	−0.03	173.45	−0.07	21.75
	27	6.07	6.80	0.01	0.02	185.61	0.04	19.69
	28	5.28	6.65	0.01	0.02	197.77	−0.01	16.30
	29	4.18	6.09	0.01	0.02	209.94	+0.03	11.59
	30	2.81	5.13	−0.01	0.02	222.12	0.06	5.82
	31	−1.24	+3.82	0.00	−0.02	234.31	+0.09	359.53
Feb.	1	+0.42	2.24	0.00	0.02	246.50	0.12	353.39
	2	2.08	+0.51	0.00	0.02	258.70	0.15	347.97
	3	3.59	−1.25	0.00	0.02	270.89	0.18	343.61
	4	4.87	2.89	0.00	0.02	283.08	0.21	340.40
	5	+5.81	−4.32	0.00	−0.02	295.28	+0.24	338.35
	6	6.37	5.46	0.00	0.02	307.47	0.26	337.39
	7	6.53	6.26	0.00	0.03	319.65	0.29	337.52
	8	6.28	6.72	0.00	0.03	331.83	0.31	338.69
	9	5.69	6.84	0.00	0.03	344.01	0.33	340.89
	10	+4.79	−6.65	0.00	−0.03	356.18	+0.36	344.05
	11	3.66	6.17	0.00	0.03	8.34	0.38	348.04
	12	2.38	5.42	0.00	0.03	20.50	0.40	352.67
	13	+1.02	4.45	0.00	0.03	32.66	0.42	357.66
	14	−0.34	3.30	0.00	0.03	44.80	0.45	2.71
	15	−1.64	−1.99	−0.01	−0.03	56.95	+0.47	7.51
	16	−2.81	−0.58	−0.01	−0.02	69.09	+0.50	11.86

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE MOON.

FOR GREENWICH MEAN MIDNIGHT

Date.		The Earth's Selenographic—		Physical Libration.		The Sun's Selenographic—		*C*
		Long.	Lat.	Long.	Lat.	Colong.	Lat.	
		°	°	°	°	°	°	°
Feb.	16	−2.81	−0.58	−0.01	−0.02	69.09	+0.50	11.86
	17	3.81	+0.87	0.01	0.02	81.23	0.53	15.58
	18	4.60	2.30	0.01	0.02	93.37	0.55	18.59
	19	5.15	3.64	0.01	0.02	105.51	0.58	20.82
	20	5.46	4.82	0.01	0.02	117.65	0.61	22.21
	21	−5.52	+5.77	−0.01	−0.02	129.80	+0.64	22.67
	22	5.35	6.42	0.01	0.02	141.95	0.67	22.07
	23	4.95	6.73	0.01	0.02	154.09	0.70	20.30
	24	4.36	6.65	0.01	0.02	166.24	0.72	17.25
	25	3.59	6.19	0.01	0.02	178.41	0.75	12.93
	26	−2.66	+5.35	−0.01	−0.02	190.58	+0.78	7.54
	27	1.61	4.17	0.01	0.02	202.76	0.80	1.53
	28	−0.47	2.72	0.01	0.02	214.95	0.83	355.47
	29	+0.73	+1.10	0.01	0.02	227.15	0.86	349.91
Mar.	1	1.92	−0.60	0.01	0.02	239.34	0.88	345.23
	2	+3.05	−2.25	−0.01	−0.02	251.55	+0.91	341.60
	3	4.03	3.74	0.01	0.02	263.75	0.93	339.07
	4	4.78	4.99	0.01	0.02	275.96	0.96	337.64
	5	5.26	5.91	0.01	0.02	288.17	0.98	337.31
	6	5.40	6.49	0.01	0.02	300.37	1.00	338.07
	7	+5.18	−6.72	−0.01	−0.02	312.57	+1.02	339.91
	8	4.63	6.62	0.01	0.02	324.77	1.04	342.78
	9	3.77	6.21	0.01	0.02	336.96	1.06	346.56
	10	2.66	5.54	0.01	0.02	349.15	1.07	351.05
	11	1.38	4.63	0.01	0.02	1.33	1.09	355.98
	12	+0.02	−3.53	−0.01	−0.02	13.50	+1.10	1.04
	13	−1.34	2.28	0.01	0.02	25.68	1.12	5.95
	14	2.62	−0.92	0.01	0.02	37.84	1.14	10.45
	15	3.72	+0.49	0.01	0.02	50.00	1.16	14.39
	16	4.58	1.91	0.02	0.02	62.16	1.17	17.67
	17	−5.15	+3.26	−0.02	−0.02	74.32	+1.19	20.19
	18	5.39	4.48	0.02	0.02	86.47	1.21	21.89
	19	5.31	5.48	0.02	0.02	98.62	1.22	22.66
	20	4.93	6.19	0.02	0.02	110.77	1.24	22.38
	21	4.30	6.56	0.02	0.02	122.93	1.26	20.91
	22	−3.49	+6.55	−0.02	−0.02	135.09	+1.27	18.13
	23	2.56	6.14	0.02	0.02	147.25	1.29	14.04
	24	1.59	5.36	0.01	0.02	159.42	1.30	8.83
	25	−0.62	4.25	0.01	0.02	171.60	1.31	2.94
	26	+0.32	2.88	0.01	0.02	183.78	1.33	356.92
	27	+1.21	+1.33	−0.01	−0.02	195.97	+1.34	351.30
	28	2.04	−0.29	0.01	0.02	208.17	1.36	346.47
	29	2.81	1.89	0.01	0.02	220.38	1.38	342.61
	30	3.49	3.36	0.01	0.02	232.59	1.39	339.78
	31	4.05	4.62	0.01	0.02	244.81	1.40	338.00
Apr.	1	+4.45	−5.60	−0.01	−0.02	257.03	+1.42	337.27
	2	+4.64	−6.25	−0.01	−0.02	269.25	+1.43	337.82

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE MOON.

FOR GREENWICH MEAN MIDNIGHT.

Date.		The Earth's Selenographic—		Physical Libration.		The Sun's Selenographic—		c
		Long.	Lat.	Long.	Lat.	Colong.	Lat.	
		°	°	°	°	°	°	°
Apr.	1	+4.45	−5.60	−0.01	−0.02	257.03	+1.42	337.27
	2	4.64	6.25	0.01	0.02	269.25	1.43	337.62
	3	4.57	6.56	0.01	0.02	281.47	1.45	339.07
	4	4.23	6.54	0.01	0.02	293.69	1.46	341.58
	5	3.59	6.20	0.01	0.02	305.91	1.47	345.09
	6	+2.69	−5.57	−0.01	−0.02	318.12	+1.47	349.40
	7	1.56	4.71	0.01	0.02	330.34	1.48	354.24
	8	+0.26	3.66	0.01	0.02	342.54	1.49	359.31
	9	−1.12	2.45	0.01	0.02	354.74	1.50	4.30
	10	2.50	−1.13	0.01	0.02	6.94	1.50	8.94
	11	−3.77	+0.24	−0.01	−0.02	19.13	+1.51	13.06
	12	4.85	1.63	0.01	0.02	31.31	1.51	16.56
	13	5.64	2.96	0.01	0.02	43.49	1.51	19.35
	14	6.08	4.18	0.02	0.02	55.67	1.52	21.37
	15	6.12	5.22	0.02	0.02	67.84	1.52	22.52
	16	−5.75	+6.00	−0.02	−0.02	80.01	+1.52	22.65
	17	5.00	6.44	0.02	0.02	92.18	1.52	21.61
	18	3.93	6.50	0.02	0.02	104.34	1.52	19.23
	19	2.66	6.15	0.02	0.02	116.51	1.52	15.45
	20	−1.31	5.41	0.02	0.02	128.68	1.52	10.40
	21	+0.02	+4.31	−0.01	−0.02	140.86	+1.52	4.48
	22	1.24	2.94	0.01	0.02	153.05	1.52	358.34
	23	2.29	+1.40	0.01	0.02	165.24	1.51	352.53
	24	3.16	−0.21	0.01	0.02	177.43	1.51	347.49
	25	3.84	1.79	0.01	0.02	189.64	1.51	343.42
	26	+4.35	−3.24	−0.01	−0.02	201.85	+1.51	340.37
	27	4.70	4.49	0.01	0.02	214.07	1.52	338.34
	28	4.88	5.48	0.01	0.02	226.30	1.52	337.33
	29	4.89	6.16	0.01	0.02	238.52	1.52	337.36
	30	4.72	6.51	0.01	0.02	250.76	1.52	338.45
May	1	+4.35	−6.52	−0.01	−0.02	262.99	+1.52	340.62
	2	3.75	6.22	0.01	0.02	275.23	1.52	343.81
	3	2.94	5.64	0.01	0.02	287.47	1.52	347.89
	4	1.90	4.80	0.01	0.02	299.70	1.52	352.61
	5	+0.69	3.76	0.01	0.02	311.93	1.52	357.66
	6	−0.66	−2.57	−0.01	−0.02	324.16	+1.51	2.70
	7	2.07	−1.27	0.01	0.02	336.38	1.51	7.46
	8	3.47	+0.09	0.01	0.02	348.60	1.50	11.74
	9	4.76	1.46	0.01	0.02	0.82	1.49	15.43
	10	5.85	2.78	0.01	0.02	13.03	1.49	18.44
	11	−6.64	+4.00	−0.01	−0.02	25.23	+1.48	20.72
	12	7.06	5.06	0.01	0.01	37.43	1.47	22.21
	13	7.04	5.89	0.01	0.01	49.62	1.45	22.77
	14	6.53	6.41	0.01	0.01	61.81	1.44	22.24
	15	5.58	6.57	0.01	0.01	73.99	1.43	20.43
	16	−4.25	+6.32	−0.01	−0.01	86.17	+1.41	17.17
	17	−2.64	+5.64	−0.01	−0.01	98.35	+1.40	12.49

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE MOON.

FOR GREENWICH MEAN MIDNIGHT.

Date.		The Earth's Selenographic—		Physical Libration.		The Sun's Selenographic—		*C*
		Long.	Lat.	Long.	Lat.	Colong.	Lat.	
		°	°	°	°	°	°	°
ay	17	−2.64	+5.64	−0.01	−0.01	98.35	+1.40	12.49
	18	−0.91	4.58	0.01	0.01	110.53	1.38	6.68
	19	+0.80	3.20	0.01	0.01	122.71	1.36	0.35
	20	2.36	+1.62	0.01	0.01	134.90	1.34	354.20
	21	3.68	−0.05	−0.01	0.01	147.10	1.32	348.76
	22	+4.72	−1.69	0.00	−0.01	159.30	+1.31	344.32
	23	5.47	3.19	0.00	0.01	171.50	1.29	340.97
	24	5.92	4.48	0.00	0.01	183.72	1.28	338.68
	25	6.11	5.50	0.00	0.01	195.94	1.27	337.44
	26	6.06	6.20	0.00	0.01	208.17	1.26	337.21
	27	+5.78	−6.58	0.00	−0.01	220.41	+1.25	338.03
	28	5.30	6.63	0.00	0.02	232.65	1.24	339.91
	29	4.62	6.36	0.00	0.02	244.89	1.23	342.81
	30	3.76	5.80	0.00	0.02	257.14	1.22	346.64
	31	2.72	4.98	0.00	0.02	269.38	1.21	351.19
une	1	+1.52	−3.95	0.00	−0.02	281.63	+1.20	356.18
	2	+0.20	2.75	0.00	0.02	293.88	1.18	1.25
	3	−1.20	1.44	0.00	0.01	306.12	1.17	6.12
	4	2.64	−0.07	−0.01	0.01	318.36	1.16	10.55
	5	4.04	+1.31	0.01	0.01	330.60	1.14	14.40
	6	−5.32	+2.64	−0.01	−0.01	342.83	+1.12	17.59
	7	6.41	3.88	0.01	0.01	355.06	1.10	20.08
	8	7.22	4.96	0.01	0.01	7.28	1.08	21.82
	9	7.66	5.84	0.01	0.01	19.50	1.06	22.72
	10	7.67	6.44	0.01	0.01	31.70	1.04	22.64
	11	−7.20	+6.70	−0.01	−0.01	43.91	+1.02	21.39
	12	6.26	6.57	0.01	0.01	56.10	0.99	18.80
	13	4.88	6.03	0.01	0.01	68.30	0.96	14.74
	14	3.17	5.07	−0.01	0.01	80.49	0.94	9.35
	15	−1.26	3.74	0.00	0.01	92.68	0.91	3.07
	16	+0.71	+2.15	0.00	−0.01	104.86	+0.88	356.62
	17	2.56	+0.41	0.00	0.01	117.06	0.85	350.68
	18	4.19	−1.34	0.00	0.01	129.25	0.82	345.71
	19	5.49	2.96	0.00	0.01	141.45	0.79	341.88
	20	6.44	4.36	0.00	0.01	153.66	0.76	339.19
	21	+7.00	−5.47	0.00	−0.01	165.87	+0.74	337.62
	22	7.20	6.25	0.00	0.01	178.09	0.72	337.13
	23	7.07	6.68	+0.01	0.01	190.32	0.70	337.70
	24	6.64	6.77	+0.01	0.01	202.55	0.68	339.33
	25	5.95	6.54	0.00	0.01	214.79	0.66	341.99
	26	+5.05	−6.01	0.00	−0.01	227.03	+0.64	345.60
	27	3.97	5.22	0.00	0.01	239.28	0.62	349.98
	28	2.74	4.21	0.00	0.01	251.53	0.61	354.86
	29	1.41	3.02	0.00	0.01	263.78	0.59	359.94
	30	+0.01	1.71	0.00	0.01	276.03	0.57	4.89
uly	1	−1.42	−0.32	0.00	−0.01	288.28	+0.55	9.46
	2	−2.82	+1.08	0.00	−0.01	300.53	+0.53	13.47

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE MOON.

FOR GREENWICH MEAN MIDNIGHT.

Date.	The Earth's Selenographic—		Physical Libration.		The Sun's Selenographic—		c
	Long.	Lat.	Long.	Lat.	Colong.	Lat.	
	°	°	°	°	°	°	°
July 1	−1.42	−0.32	0.00	−0.01	288.28	+0.55	9.46
2	2.82	+1.08	0.00	0.01	300.53	0.53	13.47
3	4.16	2.44	0.00	0.01	312.78	0.51	16.84
4	5.38	3.71	0.00	0.01	325.02	0.49	19.51
5	6.40	4.83	0.00	0.01	337.26	0.46	21.45
6	−7.16	+5.75	0.00	−0.01	349.50	+0.44	22.59
7	7.61	6.42	0.00	0.01	1.72	0.41	22.82
8	7.67	6.77	0.00	0.01	13.94	0.39	22.01
9	7.32	6.76	0.00	0.01	26.16	0.36	19.98
10	6.52	6.37	0.00	0.01	38.37	0.33	16.59
11	−5.30	+5.56	0.00	−0.01	50.57	+0.29	11.82
12	3.71	4.38	0.00	0.01	62.76	0.26	5.95
13	−1.87	2.87	0.00	0.01	74.96	0.22	359.52
14	+0.11	+1.14	0.00	0.01	87.14	0.19	353.25
15	2.08	−0.67	+0.01	0.01	99.33	0.15	347.72
16	+3.88	−2.41	+0.01	−0.01	111.52	+0.12	343.29
17	5.41	3.96	0.01	0.01	123.72	0.08	340.05
18	6.57	5.22	0.01	0.01	135.92	0.05	338.01
19	7.31	6.12	0.01	0.01	148.12	+0.02	337.13
20	7.63	6.66	0.01	0.01	160.33	−0.01	337.39
21	+7.53	−6.84	+0.01	−0.01	172.55	−0.03	338.75
22	7.07	6.67	0.01	0.01	184.77	0.06	341.18
23	6.30	6.20	0.01	0.01	197.00	0.08	344.59
24	5.27	5.45	0.01	0.01	209.23	0.10	348.81
25	4.06	4.47	0.01	0.01	221.47	0.12	353.60
26	+2.72	−3.31	+0.01	−0.01	233.72	−0.14	358.66
27	+1.31	2.02	0.01	0.01	245.96	0.16	3.66
28	−0.11	−0.64	0.01	0.01	258.21	0.18	8.35
29	1.50	+0.77	0.01	0.01	270.46	0.20	12.54
30	2.82	2.16	+0.01	0.01	282.71	0.22	16.09
31	−4.02	+3.46	0.00	−0.01	294.96	−0.24	18.96
Aug. 1	5.06	4.62	0.00	0.01	307.20	0.26	21.08
2	5.91	5.58	0.00	0.01	319.45	0.29	22.42
3	6.53	6.30	0.00	0.01	331.68	0.31	22.89
4	6.88	6.72	0.00	0.01	343.91	0.34	22.37
5	−6.92	+6.80	0.00	−0.01	356.14	−0.36	20.72
6	6.64	6.52	+0.01	0.01	8.36	0.39	17.82
7	6.01	5.85	0.01	0.01	20.57	0.42	13.62
8	5.02	4.83	0.01	0.01	32.78	0.45	8.27
9	3.72	3.47	0.01	0.01	44.97	0.48	2.16
10	−2.15	+1.86	+0.01	−0.01	57.16	−0.51	355.88
11	−0.40	+0.10	0.01	0.01	69.35	0.55	350.06
12	+1.43	−1.67	0.01	0.01	81.53	0.58	345.12
13	3.19	3.32	0.01	0.01	93.72	0.62	341.31
14	4.76	4.72	0.02	−0.01	105.90	0.65	338.71
15	+6.03	−5.79	+0.02	0.00	118.08	−0.68	337.32
16	+6.90	−6.47	+0.02	0.00	130.27	−0.71	337.13

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE MOON.

FOR GREENWICH MEAN MIDNIGHT.

Date.		The Earth's Selenographic—		Physical Libration.		The Sun's Selenographic—		*C*
		Long.	Lat.	Long.	Lat.	Colong.	Lat.	
		°	°	°	°	°	°	°
Aug.	16	+6.90	−6.47	+0.02	0.00	130.27	−0.71	337.13
	17	7.32	6.76	0.02	0.00	142.47	0.74	338.12
	18	7.31	6.69	0.02	0.00	154.67	0.76	340.26
	19	6.89	6.29	0.02	0.00	166.87	0.78	343.45
	20	6.10	5.60	0.02	0.00	179.08	0.80	347.52
	21	+5.04	−4.67	+0.02	0.00	191.30	−0.82	352.23
	22	3.77	3.55	0.02	0.00	203.53	0.84	357.27
	23	2.39	2.29	0.02	0.00	215.75	0.86	2.32
	24	+0.96	−0.94	0.02	0.00	227.98	0.88	7.13
	25	−0.43	+0.46	0.01	0.00	240.22	0.89	11.47
	26	−1.74	+1.84	+0.01	0.00	252.46	−0.91	15.22
	27	2.91	3.15	0.01	0.00	264.70	0.92	18.30
	28	3.90	4.34	0.01	0.00	276.94	0.94	20.65
	29	4.68	5.34	0.01	0.00	289.18	0.96	22.21
	30	5.24	6.09	0.01	0.00	301.41	0.97	22.90
	31	−5.58	+6.56	+0.01	0.00	313.65	−0.99	22.61
Sept.	1	5.70	6.69	0.01	0.00	325.88	1.00	21.23
	2	5.59	6.48	0.01	0.00	338.10	1.02	18.64
	3	5.25	5.90	0.01	0.00	350.32	1.04	14.81
	4	4.68	4.98	0.01	0.00	2.53	1.06	9.85
	5	−3.89	+3.75	+0.01	0.00	14.73	−1.08	4.07
	6	2.87	2.28	0.01	0.00	26.92	1.11	357.98
	7	1.65	+0.63	0.02	0.00	39.11	1.13	352.12
	8	−0.26	−1.08	0.02	0.00	51.29	1.16	346.95
	9	+1.22	2.72	0.02	0.00	63.47	1.18	342.74
	10	+2.71	−4.17	+0.02	0.00	75.64	−1.21	339.65
	11	4.09	5.34	0.02	0.00	87.81	1.23	337.74
	12	5.24	6.15	0.02	0.00	99.98	1.26	337.03
	13	6.08	6.58	0.02	0.00	112.15	1.28	337.55
	14	6.51	6.61	0.02	0.00	124.32	1.30	339.28
	15	+6.52	−6.29	+0.02	0.00	136.50	−1.32	342.16
	16	6.13	5.66	0.02	0.00	148.69	1.33	346.08
	17	5.36	4.78	0.02	0.00	160.88	1.34	350.63
	18	4.30	3.70	0.02	0.00	173.07	1.35	355.66
	19	3.02	2.47	0.02	0.00	185.27	1.36	0.78
	20	+1.63	−1.16	+0.02	0.00	197.48	−1.37	5.69
	21	+0.21	+0.21	0.02	0.00	209.69	1.38	10.20
	22	−1.14	1.57	0.01	0.00	221.90	1.39	14.14
	23	2.35	2.88	0.01	0.00	234.12	1.40	17.45
	24	3.36	4.07	0.01	0.00	246.34	1.40	20.04
	25	−4.11	+5.09	+0.01	0.00	258.57	−1.41	21.86
	26	4.60	5.88	0.01	0.00	270.79	1.41	22.83
	27	4.81	6.39	0.01	0.00	283.02	1.42	22.82
	28	4.78	6.57	0.01	0.00	295.24	1.42	21.71
	29	4.52	6.40	0.01	0.00	307.46	1.43	19.39
	30	−4.10	+5.86	+0.01	0.00	319.68	−1.43	15.80
Oct.	1	−3.53	+4.98	+0.01	0.00	331.89	−1.44	11.05

ILLUMINATED DISK OF MERCURY, 1916.

FOR GREENWICH MEAN NOON.

Date.	*k*	*i*	θ	*L*	Stellar Mag.	Date.	*k*	*i*	θ	*L*	Stellar Mag.
		°	°					°	°		
Jan. 1	0.958	24	4	33.4	−0.8	July 4	0.476	93	170	45.2	+0.2
6	0.917	34	358	40.3	0.8	9	0.621	76	175	54.9	−0.3
11	0.842	47	352	49.8	0.7	14	0.774	57	182	63.9	0.8
16	0.719	64	347	60.7	0.6	19	0.904	36	191	68.3	1.3
21	0.524	87	342	65.1	−0.3	24	0.982	16	208	64.8	1.6
26	0.294	114	337	51.9	+0.4	29	0.998	6	320	56.1	−1.6
31	0.085	146	327	19.1	1.6	Aug. 3	0.971	20	3	46.7	1.2
Feb. 5	0.009	169	248	2.0	2.7	8	0.927	31	12	39.4	0.8
10	0.080	147	182	15.4	1.7	13	0.877	41	18	34.5	0.4
15	0.220	124	174	31.4	1.1	18	0.827	49	21	31.4	−0.2
20	0.359	106	170	37.0	+0.7	23	0.775	56	23	29.8	0.0
25	0.474	93	166	36.5	0.5	28	0.723	64	25	29.5	+0.2
Mar. 1	0.566	82	163	34.2	0.4	Sept. 2	0.665	71	26	30.3	0.3
6	0.641	74	160	32.1	0.3	7	0.596	79	28	31.7	0.4
11	0.704	66	157	30.7	0.2	12	0.516	88	29	33.7	0.5
16	0.754	59	154	30.0	+0.1	17	0.415	100	30	35.1	+0.6
21	0.806	52	152	30.5	−0.1	22	0.283	116	32	32.4	0.9
26	0.852	45	150	32.4	0.3	27	0.148	135	36	23.2	1.4
31	0.900	37	148	35.9	0.6	Oct. 2	0.029	160	48	6.0	2.4
Apr. 5	0.946	27	146	41.5	0.9	7	0.015	166	185	3.3	2.6
10	0.985	14	142	49.6	−1.4	12	0.153	134	204	30.7	+1.1
15	0.999	3	19	59.4	1.8	17	0.387	103	208	58.8	+0.1
20	0.966	21	338	67.6	1.6	22	0.615	77	209	65.1	−0.4
25	0.870	42	338	69.1	1.1	27	0.783	56	209	57.0	0.7
30	0.726	63	340	63.0	0.7	Nov. 1	0.886	40	209	46.3	0.8
May 5	0.571	82	343	53.3	−0.2	6	0.944	27	207	37.6	−0.8
10	0.427	98	345	43.3	+0.4	11	0.977	18	205	31.6	0.8
15	0.299	114	348	33.8	0.9	16	0.993	10	200	27.7	0.8
20	0.190	128	351	24.3	1.4	21	0.999	3	183	25.4	0.8
25	0.100	143	354	14.5	1.9	26	0.999	3	41	24.4	0.8
30	0.035	158	1	5.6	+2.5	Dec. 1	0.994	9	24	24.5	−0.7
June 4	0.004	173	39	0.7	3.3	6	0.982	15	18	25.8	0.6
9	0.014	166	139	2.4	3.0	11	0.963	22	12	28.2	0.6
14	0.063	151	153	9.6	2.2	16	0.933	30	7	32.3	0.6
19	0.139	136	158	18.8	1.7	21	0.885	40	2	38.5	0.6
24	0.235	122	162	27.7	+1.2	26	0.806	52	357	47.2	−0.6
29	0.348	108	166	36.4	+0.7	31	0.682	69	352	57.3	−0.5

NOTATION.

k=the ratio of the area of the illuminated portion of the apparent disk to the area of the entire apparent disk regarded as circular.

i=the angle between the Sun and Earth, as seen from the planet.

θ=the angle which the line joining the cusps, or extremities of the illuminated portion, makes with the meridian.

L=the brilliancy of the disk. The unit of *L* is the amount of light received by an eye from a circular disk with the same albedo as the planet, subtending an angular radius of one second of arc, situated at distance unity from the Sun, and illuminated by the latter as the mean disk of the planet is illuminated.

FOR GREENWICH MEAN NOON.

Date.	k	i	θ	L	Stellar Mag.	Date.	k	i	θ	L	Stellar Mag.
		°	°					°	°		
Jan. 1	0.892	38.4	348.5	59.1	−3.4	July 4	0.002	174.5	110.1	3.8	−2.8
6	0.882	40.1	346.5	60.4	3.4	9	0.015	165.9	155.3	23.8	3.2
11	0.872	41.8	344.6	61.9	3.4	14	0.043	156.0	164.2	63.4	3.6
16	0.862	43.6	343.0	63.5	3.4	19	0.083	146.6	167.8	107.1	3.8
21	0.851	45.4	341.5	65.2	3.4	24	0.128	138.1	170.2	144.0	4.0
26	0.839	47.3	340.2	67.0	−3.4	29	0.174	130.6	172.1	168.9	−4.1
31	0.827	49.1	339.2	69.0	3.4	Aug. 3	0.220	124.0	174.0	182.1	4.2
Feb. 5	0.815	50.9	338.4	71.1	3.5	8	0.264	118.1	176.0	186.9	4.2
10	0.801	53.0	337.8	73.4	3.5	13	0.306	112.8	178.0	185.8	4.2
15	0.787	55.0	337.4	75.9	3.5	18	0.345	108.1	180.0	180.8	4.2
20	0.772	57.0	337.3	78.6	−3.5	23	0.380	103.8	182.2	173.8	−4.1
25	0.757	59.1	337.3	81.4	3.6	28	0.414	99.9	184.4	165.9	4.1
Mar. 1	0.741	61.2	337.6	84.6	3.6	Sept. 2	0.446	96.2	186.6	157.5	4.1
6	0.724	63.4	338.0	88.0	3.6	7	0.475	92.8	188.8	149.5	4.0
11	0.706	65.7	338.7	91.6	3.6	12	0.503	89.6	191.0	141.8	4.0
16	0.687	68.0	339.6	95.6	−3.7	17	0.530	86.6	193.1	134.2	−3.9
21	0.668	70.4	340.7	99.9	3.7	22	0.555	83.7	195.1	127.7	3.9
26	0.648	72.9	341.9	104.7	3.7	27	0.579	81.0	197.0	121.4	3.9
31	0.626	75.4	343.4	109.7	3.8	Oct. 2	0.601	78.4	198.8	115.7	3.8
Apr. 5	0.603	78.1	345.0	115.1	3.8	7	0.623	75.8	200.4	110.2	3.8
10	0.579	80.8	346.7	121.3	−3.9	12	0.644	73.2	201.8	105.3	−3.7
15	0.554	83.7	348.6	127.7	3.9	17	0.664	70.8	203.0	100.7	3.7
20	0.528	86.7	350.5	134.7	3.9	22	0.683	68.5	203.9	96.4	3.7
25	0.501	89.9	352.4	142.3	4.0	27	0.702	66.2	204.6	92.6	3.7
30	0.471	93.3	354.3	150.2	4.0	Nov. 1	0.720	63.9	205.1	89.1	3.6
May 5	0.441	96.9	356.2	158.6	−4.1	6	0.737	61.7	205.3	85.8	−3.6
10	0.408	100.7	358.0	167.1	4.1	11	0.753	59.6	205.3	82.6	3.6
15	0.372	104.9	359.7	174.4	4.2	16	0.769	57.5	205.0	79.8	3.5
20	0.334	109.4	1.3	181.0	4.2	21	0.784	55.4	204.4	77.1	3.5
25	0.294	114.4	2.7	185.1	4.2	26	0.799	53.3	203.5	74.6	3.5
30	0.250	120.0	3.8	184.3	−4.2	Dec. 1	0.813	51.3	202.4	72.3	−3.5
June 4	0.204	126.3	4.9	176.5	4.2	6	0.826	49.3	201.0	70.1	3.5
9	0.157	133.3	5.9	159.3	4.2	11	0.838	47.4	199.3	68.1	3.4
14	0.110	141.2	7.1	130.3	4.0	16	0.850	45.5	197.3	66.2	3.4
19	0.067	150.1	9.0	90.1	3.8	21	0.862	43.6	195.1	64.4	3.4
24	0.031	159.8	13.1	46.3	−3.5	26	0.873	41.8	192.7	62.7	−3.4
29	0.008	169.8	27.7	12.8	−3.0	31	0.884	39.9	190.1	61.2	−3.4

NOTATION.

k=the ratio of the area of the illuminated portion of the apparent disk to the area of the entire apparent disk regarded as circular.

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θ=the angle which the line joining the cusps, or extremities of the illuminated portion, makes with the meridian.

L=the brilliancy of the disk. The unit of L is the amount of light received by an eye from a circular disk with the same albedo as the planet, subtending an angular radius of one second of arc, situated at distance unity from the Sun, and illuminated by the latter as the mean disk of the planet is illuminated.

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF MARS.

FOR GREENWICH MEAN NOON.

Date.	Light-Time.	Stellar Magnitude.	P	$A_{\oplus}+180^\circ$	$D_{\oplus}$	$A_{\odot}-A_{\oplus}$	$D_{\odot}$	$\odot_{♂}$
	m		°	°	°	°	°	°
Jan. 1	6.86	−0.2	9.54	240.18	+19.36	−27.91	+13.36	34.65
3	6.75	0.3	9.52	240.16	19.28	27.02	13.67	35.55
5	6.64	0.3	9.48	240.08	19.18	26.07	13.97	36.45
7	6.54	0.4	9.41	239.94	19.08	25.06	14.27	37.34
9	6.44	0.4	9.30	239.75	18.96	23.99	14.57	38.24
11	6.34	−0.5	9.16	239.50	+18.84	−22.87	+14.86	39.13
13	6.25	0.5	8.99	239.19	18.70	21.69	15.15	40.03
15	6.16	0.6	8.79	238.83	18.56	20.46	15.44	40.92
17	6.08	0.6	8.55	238.42	18.41	19.17	15.72	41.81
19	6.01	0.7	8.28	237.96	18.25	17.82	16.00	42.70
21	5.94	−0.7	7.99	237.44	+18.08	−16.43	+16.27	43.58
23	5.87	0.7	7.66	236.88	17.90	14.99	16.54	44.47
25	5.81	0.8	7.31	236.27	17.72	13.50	16.81	45.36
27	5.76	0.8	6.93	235.62	17.52	11.96	17.07	46.24
29	5.72	0.9	6.53	234.93	17.33	10.39	17.33	47.13
31	5.68	−0.9	6.10	234.21	+17.13	− 8.78	+17.58	48.01
Feb. 2	5.65	0.9	5.66	233.46	16.92	7.14	17.83	48.89
4	5.63	1.0	5.20	232.69	16.71	5.48	18.08	49.77
6	5.62	1.0	4.73	231.90	16.50	3.80	18.32	50.65
8	5.61	1.0	4.25	231.10	16.30	2.11	18.56	51.53
10	5.61	−1.0	3.76	230.30	+16.09	− 0.41	+18.79	52.41
12	5.62	1.0	3.28	229.50	15.89	+ 1.29	19.02	53.29
14	5.63	1.0	2.80	228.71	15.69	2.98	19.24	54.17
16	5.65	0.9	2.32	227.93	15.50	4.65	19.46	55.04
18	5.68	0.9	1.86	227.17	15.32	6.31	19.67	55.92
20	5.72	−0.9	1.41	226.44	+15.15	+ 7.95	+19.88	56.80
22	5.77	0.8	0.97	225.73	14.99	9.56	20.09	57.67
24	5.82	0.8	0.56	225.06	14.85	11.14	20.29	58.55
26	5.88	0.8	0.16	224.43	14.72	12.68	20.48	59.42
28	5.94	0.7	359.80	223.83	14.60	14.19	20.67	60.30
Mar. 1	6.01	−0.7	359.45	223.28	+14.49	+15.65	+20.86	61.17
3	6.09	0.6	359.14	222.78	14.41	17.07	21.04	62.04
5	6.17	0.6	358.86	222.32	14.34	18.44	21.21	62.92
7	6.26	0.5	358.60	221.92	14.28	19.77	21.38	63.79
9	6.35	0.5	358.38	221.56	14.25	21.04	21.55	64.66
11	6.45	−0.4	358.20	221.26	+14.23	+22.27	+21.71	65.54
13	6.55	0.4	358.04	221.01	14.23	23.45	21.87	66.41
15	6.66	0.3	357.92	220.81	14.25	24.58	22.02	67.28
17	6.77	0.3	357.82	220.66	14.28	25.66	22.16	68.16
19	6.88	0.2	357.76	220.56	14.33	26.69	22.30	69.03
21	7.00	−0.2	357.73	220.50	+14.39	+27.67	+22.44	69.90
23	7.12	0.1	357.73	220.50	14.47	28.61	22.57	70.78
25	7.24	−0.1	357.76	220.54	14.57	29.51	22.69	71.65
27	7.37	0.0	357.81	220.63	14.68	30.36	22.81	72.52
29	7.50	0.0	357.90	220.76	14.80	31.16	22.92	73.40
31	7.63	+0.1	358.01	220.94	+14.93	+31.93	+23.03	74.27
Apr. 2	7.76	+0.1	358.14	221.16	+15.08	+32.66	+23.13	75.15

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF MARS.

FOR GREENWICH MEAN NOON.

Date.		k	Diameter.	i	q	Q	Central Meridian.	Mean Time of Transit of Zero Meridian.	
								Of Date.	Of Intermediate Date.
			″	°	″	°	°	h m	h m
an.	1	0.944	12.23	27.41	0.69	287.90	331.50	1 56.9	2 34.2
	3	0.947	12.43	26.48	0.65	287.61	313.34	3 11.5	3 48.6
	5	0.951	12.63	25.49	0.61	287.28	295.23	4 25.7	5 2.8
	7	0.955	12.84	24.46	0.57	286.91	277.18	5 39.8	6 16.7
	9	0.959	13.04	23.37	0.53	286.49	259.18	6 53.6	7 30.4
	11	0.963	13.24	22.23	0.49	286.00	241.24	8 7.2	8 43.9
	13	0.967	13.43	21.04	0.45	285.42	223.35	9 20.5	9 57.1
	15	0.970	13.62	19.80	0.40	284.76	205.51	10 33.6	11 10.1
	17	0.974	13.80	18.51	0.36	284.00	187.73	11 46.5	12 22.9
	19	0.978	13.97	17.17	0.31	283.11	170.00	12 59.2	13 35.4
	21	0.981	14.14	15.79	0.27	282.07	152.31	14 11.6	14 47.8
	23	0.984	14.29	14.37	0.22	280.83	134.68	15 23.9	15 59.9
	25	0.987	14.43	12.92	0.18	279.32	117.08	16 36.0	17 11.9
	27	0.990	14.56	11.43	0.14	277.42	99.53	17 47.9	18 23.8
	29	0.993	14.67	9.92	0.11	274.98	82.01	18 59.6	19 35.5
	31	0.995	14.77	8.39	0.08	271.69	64.53	20 11.3	20 47.0
eb.	2	0.997	14.84	6.88	0.05	266.99	47.07	21 22.8	21 58.5
	4	0.998	14.90	5.41	0.04	259.77	29.63	22 34.2	23 10.0
	6	0.999	14.94	4.05	0.02	247.60	12.20	23 45.7	. . . . .
	8	0.999	14.96	3.02	0.01	225.64	354.79	0 21.4	0 57.0
	10	0.999	14.96	2.72	0.01	191.96	337.38	1 32.7	2 8.4
	12	0.999	14.94	3.36	0.01	162.04	319.96	2 44.1	3 19.8
	14	0.998	14.90	4.54	0.02	144.56	302.53	3 55.6	4 31.3
	16	0.997	14.84	5.94	0.04	134.69	285.09	5 7.1	5 42.9
	18	0.996	14.76	7.42	0.06	128.60	267.62	6 18.7	6 54.6
	20	0.994	14.67	8.93	0.09	124.49	250.13	7 30.4	8 6.4
	22	0.992	14.55	10.44	0.12	121.53	232.61	8 42.3	9 18.3
	24	0.989	14.43	11.93	0.16	119.27	215.05	9 54.3	10 30.4
	26	0.986	14.28	13.39	0.19	117.49	197.45	11 6.5	11 42.7
	28	0.983	14.13	14.81	0.24	116.03	179.82	12 18.9	12 55.1
ar.	1	0.980	13.96	16.20	0.28	114.82	162.13	13 31.4	14 7.8
	3	0.977	13.79	17.54	0.32	113.79	144.40	14 44.2	15 20.7
	5	0.973	13.60	18.84	0.36	112.91	126.62	15 57.2	16 33.8
	7	0.970	13.41	20.09	0.41	112.14	108.79	17 10.4	17 47.1
	9	0.966	13.22	21.29	0.45	111.47	90.91	18 23.8	19 0.6
	11	0.962	13.02	22.44	0.49	110.90	72.97	19 37.5	20 14.4
	13	0.958	12.81	23.53	0.53	110.39	54.98	20 51.4	21 28.4
	15	0.955	12.61	24.58	0.57	109.93	36.94	22 5.5	22 42.7
	17	0.951	12.40	25.57	0.61	109.54	18.85	23 19.9	23 57.1
	19	0.947	12.20	26.51	0.64	109.19	0.70	. . . . .	0 34.4
	21	0.944	11.99	27.41	0.67	108.89	342.51	1 11.8	1 49.2
	23	0.940	11.79	28.26	0.70	108.64	324.27	2 26.6	3 4.2
	25	0.937	11.59	29.06	0.73	108.42	305.98	3 41.7	4 19.3
	27	0.934	11.39	29.81	0.75	108.24	287.65	4 57.0	5 34.7
	29	0.931	11.19	30.52	0.78	108.08	269.27	6 12.5	6 50.3
	31	0.928	11.00	31.19	0.80	107.96	250.84	7 28.1	8 6.0
pr.	2	0.925	10.81	31.81	0.81	107.86	232.38	8 44.0	9 21.9

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF MARS.

FOR GREENWICH MEAN NOON.

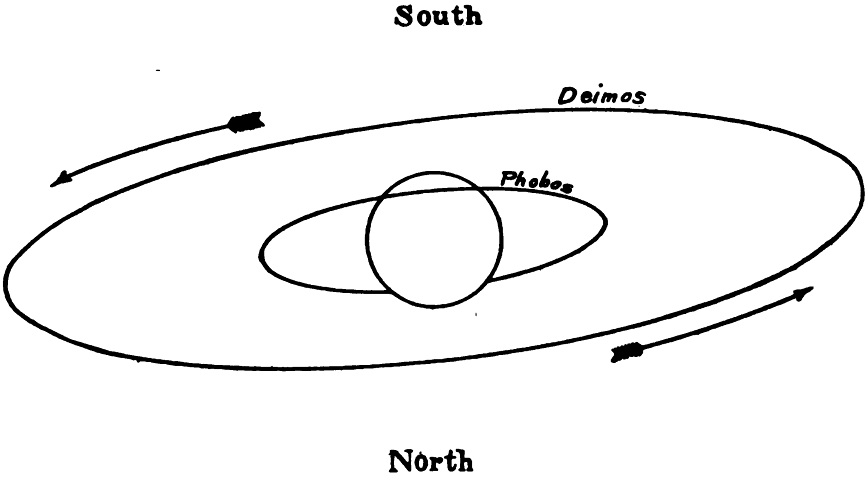
Date.	Light-Time.	Stellar Magnitude.	P	$A_{\oplus}+180°$	$D_{\oplus}$	$A_{\odot}-A_{\oplus}$	$D_{\odot}$	$\odot_{♂}$
	m		°	°	°	°	°	°
Mar. 31	7.63	+0.1	358.01	220.94	+14.93	+31.93	+23.03	74.27
Apr. 2	7.76	0.1	358.14	221.16	15.08	32.66	23.13	75.15
4	7.90	0.2	358.30	221.42	15.24	33.35	23.23	76.02
6	8.03	0.2	358.49	221.72	15.41	34.00	23.32	76.90
8	8.17	0.3	358.70	222.05	15.58	34.61	23.40	77.78
10	8.31	+0.3	358.93	222.43	+15.77	+35.18	+23.48	78.65
12	8.45	0.4	359.19	222.84	15.97	35.73	23.56	79.53
14	8.59	0.4	359.46	223.28	16.17	36.24	23.62	80.41
16	8.74	0.4	359.75	223.76	16.38	36.72	23.69	81.29
18	8.88	0.5	0.07	224.27	16.60	37.17	23.74	82.17
20	9.02	+0.5	0.40	224.81	+16.83	+37.59	+23.79	83.05
22	9.17	0.6	0.74	225.38	17.06	37.98	23.84	83.93
24	9.31	0.6	1.11	225.98	17.29	38.35	23.88	84.81
26	9.46	0.6	1.49	226.60	17.53	38.68	23.91	85.69
28	9.60	0.7	1.88	227.25	17.77	39.00	23.93	86.57
30	9.75	+0.7	2.29	227.93	+18.01	+39.29	+23.96	87.46
May 2	9.90	0.7	2.72	228.64	18.26	39.55	23.97	88.34
4	10.04	0.8	3.15	229.36	18.51	39.79	23.98	89.23
6	10.19	0.8	3.60	230.12	18.76	40.01	23.98	90.12
8	10.33	0.8	4.06	230.89	19.01	40.21	23.98	91.01
10	10.48	+0.9	4.54	231.69	+19.26	+40.38	+23.96	91.90
12	10.62	0.9	5.02	232.51	19.51	40.54	23.95	92.79
14	10.77	0.9	5.52	233.35	19.76	40.67	23.93	93.68
16	10.91	0.9	6.02	234.22	20.00	40.78	23.90	94.57
18	11.05	1.0	6.53	235.10	20.25	40.88	23.86	95.47
20	11.20	+1.0	7.05	236.00	+20.49	+40.96	+23.82	96.36
22	11.34	1.0	7.58	236.92	20.74	41.02	23.78	97.26
24	11.48	1.0	8.12	237.86	20.97	41.06	23.72	98.16
26	11.62	1.1	8.67	238.81	21.21	41.09	23.66	99.06
28	11.76	1.1	9.22	239.78	21.44	41.10	23.60	99.96
30	11.90	+1.1	9.78	240.78	+21.67	+41.09	+23.52	100.86
June 1	12.03	1.1	10.35	241.78	21.89	41.06	23.44	101.77
3	12.17	1.2	10.92	242.80	22.11	41.02	23.36	102.68
5	12.31	1.2	11.50	243.84	22.32	40.97	23.27	103.59
7	12.44	1.2	12.08	244.90	22.53	40.90	23.17	104.50
9	12.58	+1.2	12.66	245.97	+22.73	+40.81	+23.07	105.41
11	12.71	1.2	13.25	247.06	22.92	40.71	22.96	106.32
13	12.84	1.3	13.85	248.16	23.11	40.60	22.84	107.24
15	12.97	1.3	14.44	249.27	23.29	40.47	22.72	108.16
17	13.10	1.3	15.04	250.40	23.46	40.33	22.59	109.08
19	13.23	+1.3	15.64	251.54	+23.62	+40.18	+22.45	110.00
21	13.35	1.3	16.25	252.69	23.78	40.02	22.31	110.92
23	13.48	1.3	16.85	253.85	23.93	39.84	22.16	111.85
25	13.60	1.4	17.45	255.03	24.07	39.65	22.01	112.77
27	13.73	1.4	18.06	256.22	24.20	39.44	21.85	113.70
29	13.85	+1.4	18.66	257.42	+24.32	+39.23	+21.68	114.64
July 1	13.97	+1.4	19.27	258.65	+24.43	+39.00	+21.51	115.57

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF MARS.

FOR GREENWICH MEAN NOON.

Date.		k	Diameter.	i	q	Q	Central Meridian.	Mean Time of Transit of Zero Meridian.	
								Of Date.	Of Intermediate Date.
			″	°	″	°	°	h m	h m
ar.	31	0.928	11.00	31.19	0.80	107.96	250.84	7 28.1	8 6.0
pr.	2	0.925	10.81	31.81	0.81	107.86	232.38	8 44.0	9 21.9
	4	0.922	10.63	32.40	0.83	107.79	213.87	10 0.0	10 38.0
	6	0.919	10.45	32.95	0.84	107.75	195.32	11 16.2	11 54.3
	8	0.917	10.27	33.46	0.85	107.72	176.73	12 32.5	13 10.8
	10	0.915	10.10	33.93	0.86	107.71	158.11	13 49.0	14 27.4
	12	0.913	9.93	34.37	0.87	107.72	139.45	15 5.7	15 44.1
	14	0.911	9.77	34.78	0.87	107.75	120.75	16 22.5	17 1.0
	16	0.909	9.61	35.16	0.88	107.80	102.03	17 39.5	18 18.0
	18	0.907	9.45	35.50	0.88	107.85	83.27	18 56.6	19 35.2
	20	0.905	9.30	35.82	0.88	107.92	64.48	20 13.8	20 52.5
	22	0.904	9.15	36.12	0.88	108.01	45.66	21 31.2	22 9.9
	24	0.902	9.01	36.38	0.88	108.10	26.81	22 48.6	23 27.4
	26	0.901	8.87	36.63	0.88	108.20	7.93	. . . . .	0 6.2
	28	0.900	8.74	36.84	0.87	108.31	349.02	0 45.1	1 24.0
	30	0.899	8.61	37.04	0.87	108.42	330.10	2 2.8	2 41.8
ay	2	0.898	8.48	37.22	0.86	108.55	311.14	3 20.7	3 59.7
	4	0.897	8.36	37.37	0.86	108.69	292.16	4 38.7	5 17.8
	6	0.897	8.24	37.50	0.85	108.82	273.15	5 56.8	6 35.9
	8	0.896	8.12	37.62	0.84	108.96	254.13	7 15.0	7 54.1
	10	0.896	8.01	37.71	0.84	109.11	235.08	8 33.3	9 12.5
	12	0.895	7.90	37.79	0.83	109.26	216.00	9 51.7	10 30.9
	14	0.895	7.80	37.85	0.82	109.41	196.91	11 10.1	11 49.4
	16	0.894	7.69	37.90	0.81	109.56	177.80	12 28.7	13 8.0
	18	0.894	7.59	37.93	0.80	109.72	158.67	13 47.3	14 26.7
	20	0.894	7.50	37.95	0.79	109.88	139.52	15 6.0	15 45.4
	22	0.894	7.40	37.96	0.78	110.03	120.35	16 24.9	17 4.3
	24	0.894	7.31	37.95	0.77	110.19	101.16	17 43.7	18 23.2
	26	0.894	7.22	37.93	0.76	110.35	81.95	19 2.7	19 42.2
	28	0.894	7.14	37.90	0.75	110.50	62.73	20 21.7	21 1.3
	30	0.895	7.06	37.85	0.74	110.66	43.49	21 40.8	22 20.4
une	1	0.895	6.97	37.80	0.73	110.81	24.23	23 0.0	23 39.6
	3	0.895	6.90	37.73	0.72	110.96	4.96	. . . . .	0 19.3
	5	0.896	6.82	37.66	0.71	111.11	345.67	0 58.9	1 38.6
	7	0.896	6.75	37.57	0.70	111.25	326.37	2 18.2	2 57.9
	9	0.897	6.67	37.47	0.69	111.40	307.05	3 37.6	4 17.4
	11	0.897	6.60	37.37	0.68	111.53	287.71	4 57.1	5 36.9
	13	0.898	6.54	37.26	0.67	111.67	268.37	6 16.7	6 56.4
	15	0.899	6.47	37.14	0.66	111.80	249.00	7 36.3	8 16.1
	17	0.899	6.41	37.01	0.65	111.93	229.63	8 55.9	9 35.8
	19	0.900	6.34	36.87	0.64	112.05	210.24	10 15.6	10 55.5
	21	0.901	6.28	36.73	0.62	112.17	190.84	11 35.4	12 15.3
	23	0.901	6.23	36.58	0.61	112.28	171.43	12 55.2	13 35.1
	25	0.902	6.17	36.43	0.60	112.38	152.01	14 15.0	14 55.0
	27	0.903	6.11	36.26	0.59	112.49	132.57	15 35.0	16 14.9
	29	0.904	6.06	36.09	0.58	112.58	113.13	16 54.9	17 34.9
ly	1	0.905	6.01	35.92	0.57	112.67	93.67	18 14.9	18 55.0

APPARENT ORBITS OF THE SATELLITES OF MARS, AT DATE OF OPPOSITION, FEBRUARY 9, 1916, AS SEEN IN AN INVERTING TELESCOPE.



Phobos.			Deimos.		
Date.	Position Angle of Apsis.	Apparent Distance at Apsis.	Date.	Position Angle of Apsis.	Apparent Distance at Apsis.
d	°	″	d	°	″
Jan. 11	280.6	17.0	Jan. 11	281.7	42.4
Feb. 10	274.8	19.2	Feb. 10	276.3	48.0
Mar. 11	268.9	16.7	Mar. 11	270.6	41.7

GREENWICH MEAN TIME OF GREATEST ELONGATION.

Phobos.												Deimos.							
	d	h			d	h			d	h			d	h			d	h	
Jan.	17	19.6	E.	Feb.	3	13.3	W.	Feb.	20	7.0	E.	Jan.	15	20.1	E.	Feb.	13	5.0	W.
	18	22.4	W.		4	16.1	E.		21	9.8	W.		17	17.5	W.		15	2.3	E.
	20	1.2	E.		5	18.9	W.		22	12.5	E.		19	14.9	E.		16	23.7	W.
	21	3.9	W.		6	21.6	E.		23	15.3	W.		21	12.3	W.		18	21.1	E.
	22	6.7	E.		8	0.4	W.		24	18.1	E.		23	9.7	E.		20	18.5	W.
	23	9.5	W.		9	3.2	E.		25	20.9	W.		25	7.1	W.		22	15.9	E.
	24	12.3	E.		10	6.0	W.		26	23.7	E.		27	4.5	E.		24	13.3	W.
	25	15.1	W.		11	8.7	E.		28	2.5	W.		29	1.9	W.		26	10.7	E.
	26	17.8	E.		12	11.5	W.		29	5.2	E.		30	23.3	E.		28	8.1	W.
	27	20.6	W.		13	14.3	E.	Mar.	1	8.0	W.	Feb.	1	20.7	W.	Mar.	1	5.5	E.
	28	23.4	E.		14	17.1	W.		2	10.8	E.		3	18.0	E.		3	2.9	W.
	30	2.2	W.		15	19.9	E.		3	13.6	W.		5	15.4	W.		5	0.3	E.
	31	5.0	E.		16	22.7	W.		4	16.4	E.		7	12.8	E.		6	21.7	W.
Feb.	1	7.7	W.		18	1.4	E.		5	19.1	W.		9	10.2	W.		8	19.2	E.
	2	10.5	E.		19	4.2	W.		6	21.9	E.		11	7.6	E.		10	16.6	W.

For Phobos every seventh eastern and western elongation is given, and for Deimos every third; the intermediate ones may be found by adding multiples of the period of the satellite.

Sidereal period of Phobos, 7^{h} 39^{m} $13^{s}.85$. Sidereal period of Deimos, 30^{h} 17^{m} $54^{s}.87$

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF JUPITER.

FOR GREENWICH MEAN NOON.

Date.		Light-Time.	Stellar Magnitude.	P	$A_{\oplus}+180°$	$D_{\oplus}$	$A_{\odot}+180°$	$D_{\odot}$
		m		°	°	°	°	°
Jan.	1	42.89	−1.9	334.63	216.55	+1.83	227.45	+2.26
	8	43.76	1.8	334.60	217.62	1.84	228.09	2.28
	15	44.58	1.8	334.57	218.79	1.86	228.73	2.31
	22	45.36	1.8	334.55	220.06	1.89	229.37	2.33
	29	46.09	1.7	334.54	221.41	1.92	230.02	2.35
Feb.	5	46.76	−1.7	334.55	222.83	+1.95	230.66	+2.37
	12	47.36	1.7	334.57	224.32	1.99	231.30	2.40
	19	47.89	1.6	334.60	225.86	2.03	231.94	2.42
	26	48.35	1.6	334.66	227.45	2.08	232.58	2.44
Mar.	4	48.73	1.6	334.73	229.07	2.12	233.22	2.46
May	1	48.79	−1.6	336.10	242.93	+2.54	238.54	+2.62
	8	48.43	1.6	336.35	244.54	2.59	239.18	2.64
	15	48.00	1.6	336.61	246.12	2.64	239.82	2.65
	22	47.49	1.7	336.87	247.64	2.69	240.46	2.67
	29	46.92	1.7	337.14	249.12	2.74	241.10	2.69
June	5	46.30	−1.7	337.42	250.54	+2.79	241.74	+2.70
	12	45.61	1.8	337.69	251.89	2.84	242.38	2.72
	19	44.88	1.8	337.96	253.16	2.89	243.03	2.74
	26	44.10	1.8	338.22	254.35	2.93	243.67	2.75
July	3	43.28	1.9	338.47	255.44	2.98	244.31	2.77
	10	42.43	−1.9	338.70	256.43	+3.02	244.95	+2.78
	17	41.56	2.0	338.91	257.31	3.06	245.59	2.80
	24	40.68	2.0	339.10	258.06	3.10	246.23	2.81
	31	39.79	2.0	339.25	258.68	3.14	246.87	2.82
Aug.	7	38.91	2.1	339.38	259.16	3.18	247.51	2.84
	14	38.05	−2.2	339.46	259.49	+3.21	248.15	+2.85
	21	37.21	2.2	339.51	259.66	3.24	248.80	2.86
	28	36.42	2.3	339.51	259.67	3.27	249.44	2.87
Sept.	4	35.68	2.3	339.47	259.51	3.29	250.08	2.89
	11	35.00	2.3	339.39	259.20	3.31	250.72	2.90
	18	34.41	−2.4	339.28	258.72	+3.32	251.36	+2.91
	25	33.90	2.4	339.13	258.11	3.32	252.00	2.92
Oct.	2	33.50	2.4	338.95	257.37	3.32	252.64	2.93
	9	33.20	2.4	338.75	256.54	3.31	253.28	2.94
	16	33.03	2.5	338.53	255.63	3.29	253.92	2.95
	23	32.98	−2.5	338.32	254.69	+3.27	254.56	+2.96
	30	33.05	2.5	338.11	253.74	3.24	255.20	2.97
Nov.	6	33.25	2.4	337.91	252.83	3.20	255.83	2.98
	13	33.57	2.4	337.73	251.99	3.16	256.47	2.98
	20	34.01	2.4	337.58	251.25	3.12	257.11	2.99
	27	34.55	−2.4	337.45	250.63	+3.07	257.75	+3.00
Dec.	4	35.18	2.3	337.36	250.16	3.03	258.39	3.01
	11	35.90	2.3	337.29	249.84	2.99	259.02	3.01
	18	36.69	2.2	337.26	249.70	2.95	259.66	3.02
	25	37.54	2.2	337.27	249.72	2.91	260.30	3.03
	32	38.42	−2.1	337.30	249.92	+2.88	260.94	+3.03

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF JUPITER.

FOR GREENWICH MEAN NOON.

Date.		Equatorial Diameter.	Excess of Equat. Diameter over Polar.	i	q	Q	Central Meridian.		Correction for Phase.
							System I.	System II.	
		″	″	°	″	°	°	°	°
Jan.	1	38.82	2.35	10.90	0.35	67.09	215.88	288.39	−0.52
	8	38.06	2.31	10.48	0.32	67.20	239.58	258.68	0.48
	15	37.35	2.26	9.95	0.28	67.30	263.20	228.90	0.43
	22	36.71	2.22	9.32	0.24	67.43	286.76	199.06	0.38
	29	36.13	2.19	8.62	0.21	67.58	310.27	169.16	0.32
Feb.	5	35.62	2.16	7.83	0.17	67.77	333.74	139.22	−0.27
	12	35.16	2.13	6.98	0.13	68.01	357.18	109.26	0.21
	19	34.77	2.11	6.08	0.09	68.35	20.62	79.28	0.16
	26	34.44	2.09	5.14	0.07	68.80	44.05	49.31	0.12
Mar.	4	34.17	2.07	4.16	0.04	69.47	67.49	19.34	−0.08
May	1	34.13	2.07	4.39	0.05	245.00	211.80	81.11	+0.08
	8	34.38	2.08	5.36	0.08	245.77	235.70	51.60	0.12
	15	34.70	2.10	6.29	0.10	246.37	259.69	22.18	0.17
	22	35.06	2.12	7.17	0.14	246.89	283.77	352.85	0.22
	29	35.49	2.15	8.01	0.17	247.36	307.94	323.60	0.28
June	5	35.97	2.18	8.79	0.21	247.78	332.21	294.46	+0.34
	12	36.51	2.21	9.49	0.25	248.18	356.58	265.42	0.39
	19	37.11	2.24	10.12	0.29	248.57	21.05	236.47	0.44
	26	37.76	2.28	10.67	0.33	248.93	45.64	207.65	0.50
July	3	38.48	2.33	11.12	0.36	249.28	70.34	178.94	0.54
	10	39.24	2.37	11.47	0.39	249.61	95.17	150.35	+0.57
	17	40.06	2.42	11.71	0.42	249.92	120.12	121.89	0.60
	24	40.93	2.48	11.82	0.43	250.22	145.21	93.56	0.61
	31	41.85	2.53	11.80	0.44	250.49	170.43	65.36	0.60
Aug.	7	42.79	2.59	11.64	0.44	250.74	195.79	37.31	0.59
	14	43.76	2.65	11.32	0.42	250.99	221.29	9.39	+0.56
	21	44.75	2.71	10.86	0.40	251.22	246.92	341.62	0.51
	28	45.72	2.76	10.22	0.37	251.44	272.70	313.98	0.45
Sept.	4	46.67	2.82	9.43	0.32	251.67	298.61	286.47	0.39
	11	47.57	2.88	8.47	0.26	251.93	324.64	259.09	0.31
	18	48.40	2.93	7.36	0.20	252.26	350.77	231.81	+0.24
	25	49.12	2.97	6.12	0.14	252.74	16.99	204.62	0.16
Oct.	2	49.72	3.00	4.75	0.08	253.54	43.28	177.49	0.10
	9	50.15	3.03	3.28	0.04	255.15	69.59	150.39	0.05
	16	50.42	3.05	1.75	0.01	259.86	95.90	123.29	+0.01
	23	50.50	3.05	0.34	0.00	315.12	122.18	96.16	0.00
	30	50.38	3.05	1.48	0.01	57.61	148.38	68.95	−0.01
Nov.	6	50.08	3.03	3.01	0.03	63.70	174.47	41.63	0.04
	13	49.60	3.00	4.48	0.07	65.60	200.42	14.17	0.09
	20	48.97	2.96	5.86	0.13	66.51	226.19	346.54	0.15
	27	48.20	2.92	7.11	0.18	67.05	251.78	318.72	−0.22
Dec.	4	47.33	2.86	8.22	0.25	67.42	277.17	290.70	0.30
	11	46.38	2.80	9.17	0.30	67.70	302.34	262.46	0.37
	18	45.39	2.74	9.95	0.34	67.94	327.31	234.02	0.43
	25	44.36	2.68	10.56	0.38	68.16	352.06	205.38	0.49
	32	43.34	2.62	11.00	0.40	68.38	16.63	176.53	−0.53

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF JUPITER, SYSTEM I.

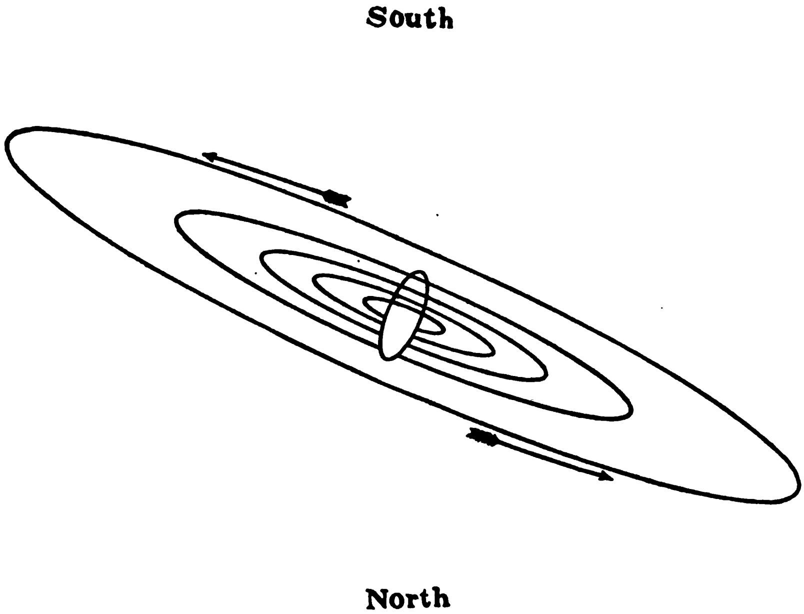
GREENWICH MEAN TIME.

Transit of Zero Meridian.				Interval between Successive Transits.	Transit of Zero Meridian.				Interval between Successive Transits.	Transit of Zero Meridian.				Interval between Successive Transits.
	d	h	m	h m		d	h	m	h m		d	h	m	h m
n.	1	3	57.31	9 50.65	June	4	5	3.86	9 50.59	Sept.	18	19	55.59	9 50.42
	3	5	10.55			6	6	16.80			20	21	7.69	
	5	6	23.79			8	7	29.72			22	22	19.78	
	7	7	37.05			10	8	42.64			24	23	31.86	
	9	8	50.32			12	9	55.55			27	0	43.93	
	11	10	3.60	9 50.66		14	11	8.44	9 50.57		29	1	55.99	9 50.41
	13	11	16.88			16	12	21.31		Oct.	1	3	8.04	
	15	12	30.18			18	13	34.16			3	4	20.09	
	17	13	43.49			20	14	47.00			5	5	32.13	
	19	14	56.80			22	15	59.83			7	6	44.16	
	21	16	10.12	9 50.67		24	17	12.64	9 50.56		9	7	56.20	9 50.41
	23	17	23.45			26	18	25.43			11	9	8.23	
	25	18	36.78			28	19	38.21			13	10	20.26	
	27	19	50.12			30	20	50.98			15	11	32.29	
	29	21	3.46		July	2	22	3.73			17	12	44.32	
	31	22	16.80	9 50.67		4	23	16.46	9 50.54		19	13	56.35	9 50.41
eb.	2	23	30.16			7	0	29.17			21	15	8.39	
	5	0	43.53			9	1	41.87			23	16	20.44	
	7	1	56.89			11	2	54.56			25	17	32.50	
	9	3	10.26			13	4	7.22			27	18	44.57	
	11	4	23.63	9 50.67		15	5	19.87	9 50.52		29	19	56.66	9 50.42
	13	5	36.99			17	6	32.50			31	21	8.77	
	15	6	50.37			19	7	45.12		Nov.	2	22	20.89	
	17	8	3.74			21	8	57.72			4	23	33.04	
	19	9	17.12			23	10	10.30			7	0	45.22	
	21	10	30.49	9 50.67		25	11	22.87	9 50.51		9	1	57.41	9 50.45
	23	11	43.86			27	12	35.42			11	3	9.63	
	25	12	57.24			29	13	47.95			13	4	21.88	
	27	14	10.61			31	15	0.46			15	5	34.15	
	29	15	23.99		Aug.	2	16	12.95			17	6	46.45	
ar.	2	16	37.36	9 50.67		4	17	25.43	9 50.49		19	7	58.77	9 50.48
	4	17	50.73			6	18	37.89			21	9	11.12	
						8	19	50.33			23	10	23.51	
						10	21	2.76			25	11	35.93	
pr.	28	7	8.57	9 50.63		12	22	15.17			27	12	48.36	
	30	8	21.75	9 50.63		14	23	27.56	9 50.47		29	14	0.82	9 50.50
ay	2	9	34.91			17	0	39.93		Dec.	1	15	13.32	
	4	10	48.07			19	1	52.29			3	16	25.84	
	6	12	1.21			21	3	4.62			5	17	38.40	
	8	13	14.34			23	4	16.94			7	18	50.98	
	10	14	27.46	9 50.62		25	5	29.25	9 50.45		9	20	3.60	9 50.53
	12	15	40.57			27	6	41.53			11	21	16.24	
	14	16	53.66			29	7	53.79			13	22	28.91	
	16	18	6.74			31	9	6.04			15	23	41.61	
	18	19	19.81		Sept.	2	10	18.28			18	0	54.34	
	20	20	32.86	9 50.61		4	11	30.50	9 50.44		20	2	7.09	9 50.56
	22	21	45.90			6	12	42.70			22	3	19.87	
	24	22	58.93			8	13	54.88			24	4	32.68	
	27	0	11.94			10	15	7.05			26	5	45.52	
	29	1	24.94			12	16	19.21			28	6	58.38	
	31	2	37.93	9 50.59		14	17	31.34	9 50.42		30	8	11.26	9 50.59
ıne	2	3	50.90			16	18	43.46			32	9	24.17	

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF JUPITER, SYSTEM II.

GREENWICH MEAN TIME.

	Transit of Zero Meridian.			Interval between Successive Transits.		Transit of Zero Meridian.			Interval between Successive Transits.		Transit of Zero Meridian.			Interv betwe Succes Transi
	d	h	m	h m		d	h	m	h m		d	h	m	h
Jan.	1	1	59.38	9 55.83	June	2	14	13.29	9 55.77	Sept.	18	3	31.69	9 55
	3	3	38.52			4	15	52.14			20	5	9.68	
	5	5	17.66			6	17	30.98			22	6	47.66	
	7	6	56.81			8	19	9.80			24	8	25.62	
	9	8	35.97			10	20	48.60			26	10	3.57	
	11	10	15.15	9 55.84		12	22	27.39	9 55.75		28	11	41.51	9 55
	13	11	54.33			15	0	6.17			30	13	19.44	
	15	13	33.52			17	1	44.94		Oct.	2	14	57.37	
	17	15	12.73			19	3	23.68			4	16	35.28	
	19	16	51.95			21	5	2.41			6	18	13.20	
	21	18	31.17	9 55.85		23	6	41.12	9 55.74		8	19	51.11	9 55
	23	20	10.39			25	8	19.82			10	21	29.02	
	25	21	49.62			27	9	58.50			12	23	6.93	
	27	23	28.86			29	11	37.17			15	0	44.84	
	30	1	8.11		July	1	13	15.82			17	2	22.75	
Feb.	1	2	47.36	9 55.85		3	14	54.46	9 55.72		19	4	0.66	9 55
	3	4	26.61			5	16	33.08			21	5	38.57	
	5	6	5.87			7	18	11.68			23	7	16.50	
	7	7	45.13			9	19	50.27			25	8	54.43	
	9	9	24.40			11	21	28.83			27	10	32.38	
	11	11	3.66	9 55.85		13	23	7.38	9 55.70		29	12	10.35	9 55
	13	12	42.93			16	0	45.92			31	13	48.33	
	15	14	22.21			18	2	24.43		Nov.	2	15	26.34	
	17	16	1.48			20	4	2.93			4	17	4.36	
	19	17	40.75			22	5	41.41			6	18	42.41	
	21	19	20.03	9 55.85		24	7	19.88	9 55.69		8	20	20.49	9 55
	23	20	59.30			26	8	58.32			10	21	58.58	
	25	22	38.58			28	10	36.76			12	23	36.70	
	28	0	17.85			30	12	15.18			15	1	14.85	
Mar.	1	1	57.13		Aug.	1	13	53.56			17	2	53.03	
	3	3	36.40	9 55.85		3	15	31.93	9 55.67		19	4	31.23	9 55
	5	5	15.67			5	17	10.29			21	6	9.46	
						7	18	48.62			23	7	47.72	
						9	20	26.95			25	9	26.01	
Apr.	26	8	31.65	9 55.81		11	22	5.26			27	11	4.34	
	28	10	10.74	9 55.81		13	23	43.54	9 55.65		29	12	42.69	9 55
	30	11	49.82			16	1	21.80		Dec.	1	14	21.07	
May	2	13	28.87			18	3	0.06			3	15	59.48	
	4	15	7.93			20	4	38.29			5	17	37.92	
	6	16	46.97			22	6	16.50			7	19	16.39	
	8	18	25.99	9 55.80		24	7	54.69	9 55.63		9	20	54.89	9 55
	10	20	5.01			26	9	32.86			11	22	33.42	
	12	21	44.02			28	11	11.02			14	0	11.98	
	14	23	23.01			30	12	49.16			16	1	50.56	
	17	1	1.98		Sept.	1	14	27.29			18	3	29.18	
	19	2	40.94	9 55.79		3	16	5.40	9 55.61		20	5	7.82	9 55
	21	4	19.90			5	17	43.48			22	6	46.49	
	23	5	58.83			7	19	21.56			24	8	25.18	
	25	7	37.75			9	20	59.62			26	10	3.91	
	27	9	16.66			11	22	37.66			28	11	42.67	
	29	10	55.55	9 55.77		14	0	15.68	9 55.60		30	13	21.44	9 55
	31	12	34.43			16	1	53.70			32	15	0.25	



APPARENT ORBITS OF THE SATELLITES OF JUPITER AT DATE OF OPPOSITION, OCTOBER 23, 1916, AS SEEN IN AN INVERTING TELESCOPE, AND ELONGATED IN THE RATIO OF THREE TO ONE IN THE DIRECTION OF THEIR MINOR AXES.

In the above diagram the central ellipse represents the disk of Jupiter, and the inner orbit is that of Satellite V.

In the diagrams of the configurations of Jupiter's four brighter satellites, pages 637–655, Jupiter is represented by a light disk, ○, in the center of the page, and the relative positions of the satellites at the Greenwich time stated above the diagrams are indicated by dots. The designation of each satellite is shown by a numeral placed to the right or left of the dot, according as the motion of the satellite at the instant in question is toward the east or toward the west, the motion being always toward the numeral. In constructing the diagrams the latitudes of the satellites are always considered zero, except where two or more of them chance to be at nearly the same distance from the planet, when they are placed one above the other, according to their apparent latitudes. If, at the epoch of any configuration, one or more satellites are projected on the disk of the planet, that phenomenon is indicated by a light disk, ○, at the left-hand side of the page; and if any satellites are invisible on account of being occulted behind the disk of the planet, or eclipsed by its shadow, that circumstance is indicated by a dark disk, ●, at the right-hand side of the page. In both cases the annexed numerals serve to point out which satellites are thus rendered invisible.

MEAN SYNODIC PERIODS OF THE SATELLITES.

	d	h	m	s		d
I.	1	18	28	35.946	=	1.769 860 49
II.	3	13	17	53.736	=	3.554 094 17
III.	7	3	59	35.856	=	7.166 387 22
IV.	16	18	5	6.916	=	16.753 552 27
V.	0	11	57	27.635	=	0.498 236 52
VI.					=	266.00
VII.					=	276.67

SATELLITE V.

GREENWICH MEAN TIME OF EVERY TWENTIETH GREATEST ELONGATION.

	d	h			d	h			d	h			d	h	
July	15	1.4	E.	Oct.	12	17.4	E.	July	15	7.4	W.	Oct.	12	23.4	W.
	25	0.6	E.		22	16.5	E.		25	6.5	W.		22	22.4	W.
Aug.	3	23.7	E.	Nov.	1	15.5	E.	Aug.	4	5.7	W.	Nov.	1	21.5	W.
	13	22.8	E.		11	14.6	E.		14	4.8	W.		11	20.6	W.
	23	21.9	E.		21	13.7	E.		24	3.9	W.		21	19.7	W.
Sept.	2	21.0	E.	Dec.	1	12.9	E.	Sept.	3	3.0	W.	Dec.	1	18.8	W.
	12	20.1	E.		11	12.0	E.		13	2.1	W.		11	18.0	W.
	22	19.2	E.		21	11.1	E.		23	1.2	W.		21	17.1	W.
Oct.	2	18.3	E.		31	10.3	E.	Oct.	3	0.3	W.		31	16.3	W.

GREENWICH MEAN TIME OF SUPERIOR GEOCENTRIC CONJUNCTION.

SATELLITE I.

	d	h	m	s		d	h	m	s		d	h	m	s		d	h	m	s
Jan.	1	12	33	40	May	18	15	56	36	Aug.	4	13	27	11	Oct.	21	9	7	21
	3	7	3	17		20	10	26	41		6	7	55	20		23	3	33	14
	5	1	32	54		22	4	56	48		8	2	23	29		24	21	59	13
	6	20	2	35		23	23	26	51		9	20	51	28		26	16	25	5
	8	14	32	17		25	17	56	56		11	15	19	31		28	10	51	5
	10	9	2	5		27	12	26	56		13	9	47	23		30	5	17	1
	12	3	31	52		29	6	56	57		15	4	15	17		31	23	43	4
	13	22	1	43		31	1	26	53		16	22	42	59	Nov.	2	18	9	2
	15	16	31	35	June	1	19	56	51		18	17	10	46		4	12	35	8
	17	11	1	32		3	14	26	44		20	11	38	21		6	7	1	11
	19	5	31	26		5	8	56	38		22	6	5	58		8	1	27	22
	21	0	1	29		7	3	26	25		24	0	33	24		9	19	53	28
	22	18	31	29		8	21	56	17		25	19	0	53		11	14	19	45
	24	13	1	34		10	16	26	2		27	13	28	12		13	8	45	58
	26	7	31	38		12	10	55	48		29	7	55	32		15	3	12	21
	28	2	1	45		14	5	25	28		31	2	22	41		16	21	38	39
	29	20	31	52		15	23	55	11	Sept.	1	20	49	53		18	16	5	8
	31	15	2	4		17	18	24	47		3	15	16	55		20	10	31	35
Feb.	2	9	32	16		19	12	54	24		5	9	43	58		22	4	58	12
	4	4	2	29		21	7	23	55		7	4	10	50		23	23	24	45
	5	22	32	43		23	1	53	29		8	22	37	46		25	17	51	30
	7	17	3	0		24	20	22	55		10	17	4	31		27	12	18	13
	9	11	33	18		26	14	52	23		12	11	31	19		29	6	45	7
	11	6	3	36		28	9	21	43		14	5	57	55	Dec.	1	1	11	58
	13	0	33	55		30	3	51	7		16	0	24	35		2	19	39	0
	14	19	4	17	July	1	22	20	21		17	18	51	5		4	14	6	1
	16	13	34	39		3	16	49	41		19	13	17	39		6	8	33	13
	18	8	5	1		5	11	18	50		21	7	44	0		8	3	0	22
	20	2	35	24		7	5	48	3		23	2	10	27		9	21	27	43
	21	21	5	50		9	0	17	7		24	20	36	44		11	15	55	3
	23	15	36	15		10	18	46	13		26	15	3	4		13	10	22	34
	25	10	6	41		12	13	15	10		28	9	29	13		15	4	50	2
	27	4	37	7		14	7	44	11		30	3	55	27		16	23	17	41
	28	23	7	35		16	2	13	3	Oct.	1	22	21	33		18	17	45	21
	..	..	..	..		17	20	41	56		3	16	47	42		20	12	13	11
May	2	17	24	30		19	15	10	40		5	11	13	42		22	6	40	58
	4	11	54	50		21	9	39	28		7	5	39	47		24	1	8	56
	6	6	25	6		23	4	8	6		9	0	5	45		25	19	36	55
	8	0	55	23		24	22	36	46		10	18	31	48		27	14	5	4
	9	19	25	37		26	17	5	15		12	12	57	41		29	8	33	8
	11	13	55	53		28	11	33	49		14	7	23	41		31	3	1	28
	13	8	26	4		30	6	2	13		16	1	49	34					
	15	2	56	14	Aug.	1	0	30	40		17	20	15	34					
	16	21	26	24		2	18	58	54		19	14	41	23					

GREENWICH MEAN TIME OF SUPERIOR GEOCENTRIC CONJUNCTION.

SATELLITE II.

	d	h	m	s		d	h	m	s		d	h	m	s		d	h	m	s
Jan.	1	4	54	42	May	11	21	42	24	Aug.	1	16	54	52	Oct.	22	7	52	54
	4	18	17	3		15	11	7	12		5	6	11	0		25	20	59	14
	8	7	39	14		19	0	32	16		8	19	26	37		29	10	5	44
	11	21	2	29		22	13	56	36		12	8	41	37	Nov.	1	23	12	20
	15	10	25	26		26	3	21	8		15	21	56	7		5	12	19	12
	18	23	49	28		29	16	45	0		19	11	9	54		9	1	26	17
	22	13	13	8	June	2	6	8	56		23	0	23	11		12	14	33	45
	26	2	37	52		5	19	32	13		26	13	35	51		16	3	41	35
	29	16	2	7		9	8	55	31		30	2	47	57		19	16	49	53
Feb.	2	5	27	28		12	22	18	11	Sept.	2	15	59	30		23	5	58	38
	5	18	52	16		16	11	40	45		6	5	10	27		26	19	7	55
	9	8	18	9		20	1	2	45		9	18	20	51		30	8	17	45
	12	21	43	24		23	14	24	35		13	7	30	43	Dec.	3	21	28	14
	16	11	9	41		27	3	45	51		16	20	40	3		7	10	39	17
	20	0	35	18		30	17	6	50		20	9	48	54		10	23	50	59
	23	14	1	57	July	4	6	27	19		23	22	57	15		14	13	3	17
	27	3	27	51		7	19	47	27		27	12	5	12		18	2	16	17
		. .	. .	. .		11	9	7	5	Oct.	1	1	12	45		21	15	29	55
		. .	. .	. .		14	22	26	17		4	14	19	58		25	4	44	13
		. .	. .	. .		18	11	44	59		8	3	26	53		28	17	59	10
May	1	5	25	40		22	1	3	14		11	16	33	35		32	7	14	45
	4	18	51	41		25	14	20	59		15	5	40	7			. .	. .	. .
	8	8	16	51		29	3	38	12		18	18	46	31			. .	. .	. .

SATELLITE III.

	d	h	m	s		d	h	m	s		d	h	m	s		d	h	m	s
Jan.	5	23	21	2	May	14	7	46	25	Aug.	1	6	32	17	Oct.	18	21	34	59
	13	3	37	45		21	12	13	24		8	10	26	55		26	0	50	29
	20	7	57	4		28	16	39	9		15	14	17	18	Nov.	2	4	5	49
	27	12	19	1	June	4	21	2	20		22	18	3	38		9	7	22	43
Feb.	3	16	43	39		12	1	23	20		29	21	44	39		16	10	42	15
	10	21	10	0		19	5	42	3	Sept.	6	1	21	8		23	14	5	27
	18	1	38	24		26	9	58	26		13	4	52	17		30	17	33	21
	25	6	7	25	July	3	14	12	35		20	8	18	58	Dec.	7	21	5	33
		. .	. .	. .		10	18	23	7		27	11	41	45		15	0	43	4
		. .	. .	. .		17	22	30	30	Oct.	4	15	1	26		22	4	24	57
May	7	3	17	43		25	2	33	27		11	18	19	15		29	8	11	55

SATELLITE IV.

	d	h	m	s		d	h	m	s		d	h	m	s		d	h	m	s
Jan.	3	14	57	47	May	17	12	16	23	Aug.	9	12	52	16	Oct.	31	17	0	58
	20	10	39	33	June	3	8	43	28		26	5	47	58	Nov.	17	7	20	50
Feb.	6	6	53	58		20	4	45	28	Sept.	11	21	42	23	Dec.	3	22	23	25
	23	3	32	30	July	7	0	12	43		28	12	40	53		20	14	26	0
		. .	. .	. .		23	18	57	46	Oct.	15	2	58	4			. .	. .	. .

DIFFERENTIAL COORDINATES OF SATELLITE VI.

Greenwich Mean Noon.	$\alpha_{VI}-\alpha_{Jup.}$		$\delta_{VI}-\delta_{Jup.}$	Greenwich Mean Noon.	$\alpha_{VI}-\alpha_{Jup.}$		$\delta_{VI}-\delta_{Jup.}$	Greenwich Mean Noon.	$\alpha_{VI}-\alpha_{Jup.}$		$\delta_{VI}-\delta_{Jup.}$
	m	s	′		m	s	′		m	s	′
Jan. 1	−2	3	+1.9	June 8	+2	41	+ 9.0	Sept. 20	−3	21	−10.1
3	1	55	1.5	10	2	36	9.6	22	3	15	11.3
5	1	47	1.1	12	2	30	10.2	24	3	9	12.4
7	1	38	0.7	14	2	24	10.7	26	3	1	13.4
9	1	30	+0.3	16	2	18	11.3	28	2	53	14.4
11	−1	21	−0.1	18	+2	12	+11.8	30	−2	44	−15.3
13	1	12	0.6	20	2	5	12.4	Oct. 2	2	35	16.2
15	1	3	1.0	22	1	58	12.9	4	2	24	17.0
17	0	54	1.4	24	1	50	13.4	6	2	13	17.8
19	0	45	1.8	26	1	42	13.9	8	2	2	18.4
21	−0	36	−2.2	28	+1	34	+14.3	10	−1	50	−19.0
23	0	27	2.6	30	1	26	14.8	12	1	38	19.6
25	0	18	3.1	July 2	1	17	15.2	14	1	25	20.1
27	0	10	3.4	4	1	7	15.5	16	1	12	20.5
29	−0	1	3.8	6	0	58	15.9	18	0	58	20.8
31	+0	8	−4.2	8	+0	48	+16.2	20	−0	45	−21.1
Feb. 2	0	16	4.6	10	0	38	16.4	22	0	31	21.4
4	0	24	4.9	12	0	28	16.6	24	0	17	21.5
6	0	33	5.2	14	0	17	16.8	26	−0	4	21.7
8	0	41	5.5	16	+0	6	16.9	28	+0	10	21.7
10	+0	49	−5.8	18	−0	5	+17.0	30	+0	24	−21.7
12	0	56	6.1	20	0	16	16.9	Nov. 1	0	38	21.7
14	1	4	6.4	22	0	28	16.8	3	0	52	21.6
16	1	12	6.6	24	0	39	16.7	5	1	5	21.4
18	1	19	6.8	26	0	50	16.5	7	1	18	21.2
20	+1	26	−7.0	28	−1	2	+16.2	9	+1	31	−21.0
22	1	32	7.2	30	1	13	15.9	11	1	43	20.7
24	1	38	7.4	Aug. 1	1	25	15.5	13	1	55	20.3
26	1	44	7.6	3	1	36	15.1	15	2	7	19.9
28	1	50	7.7	5	1	47	14.6	17	2	18	19.5
Mar. 1	+1	55	−7.8	7	−1	58	+14.0	19	+2	29	−19.0
	.	. .	. .	9	2	8	13.4	21	2	40	18.6
	.	. .	. .	11	2	19	12.6	23	2	50	18.0
	.	. .	. . .	13	2	28	11.9	25	2	59	17.5
May 3	+3	27	−1.0	15	2	38	11.0	27	3	8	16.9
5	+3	26	−0.5	17	−2	47	+10.1	29	+3	17	−16.3
7	3	25	0.0	19	2	55	9.1	Dec. 1	3	25	15.7
9	3	24	+0.5	21	3	3	8.1	3	3	32	15.1
11	3	23	1.0	23	3	10	7.0	5	3	39	14.4
13	3	22	1.6	25	3	16	5.9	7	3	45	13.7
15	+3	20	+2.1	27	−3	22	+ 4.8	9	+3	51	−13.0
17	3	19	2.6	29	3	27	3.6	11	3	56	12.4
19	3	17	3.2	31	3	31	2.3	13	4	1	11.6
21	3	14	3.8	Sept. 2	3	34	+ 1.1	15	4	5	10.9
23	3	12	4.3	4	3	36	− 0.1	17	4	9	10.1
25	+3	9	+4.9	6	−3	38	− 1.5	19	+4	12	− 9.5
27	3	6	5.5	8	3	38	2.8	21	4	15	8.7
29	3	2	6.0	10	3	38	4.0	23	4	17	8.0
31	2	59	6.6	12	3	36	5.3	25	4	19	7.2
June 2	2	55	7.2	14	3	34	6.5	27	4	20	6.5
4	+2	50	+7.8	16	−3	30	− 7.8	29	+4	21	− 5.7
6	+2	46	+8.4	18	−3	26	− 9.0	31	+4	21	− 5.0

DIFFERENTIAL COORDINATES OF SATELLITE VII.

eenwich Mean Noon.	$\alpha_{VII}-\alpha_{Jup.}$		$\delta_{VII}-\delta_{Jup.}$	Greenwich Mean Noon.	$\alpha_{VII}-\alpha_{Jup.}$		$\delta_{VII}-\delta_{Jup.}$	Greenwich Mean Noon.	$\alpha_{VII}-\alpha_{Jup.}$		$\delta_{VII}-\delta_{Jup.}$
	m	s	′		m	s	′		m	s	′
n. 1	+0	23	−14.9	June 8	−1	40	+9.5	Sept. 20	+2	19	−8.3
3	+0	12	15.2	10	1	34	9.3	22	2	8	8.3
5	0	0	15.5	12	1	27	9.2	24	1	56	8.2
7	−0	11	15.7	14	1	21	9.0	26	1	43	8.2
9	0	22	15.8	16	1	14	8.9	28	1	30	8.1
11	−0	33	−15.8	18	−1	7	+8.7	30	+1	16	−8.0
13	0	43	15.8	20	1	0	8.5	Oct. 2	1	2	7.8
15	0	54	15.7	22	0	53	8.2	4	0	47	7.7
17	1	4	15.6	24	0	46	8.0	6	0	32	7.5
19	1	14	15.4	26	0	38	7.7	8	0	17	7.3
21	−1	23	−15.2	28	−0	30	+7.5	10	+0	1	−7.1
23	1	32	14.9	30	0	23	7.2	12	−0	14	6.9
25	1	41	14.6	July 2	0	15	6.9	14	0	30	6.6
27	1	50	14.2	4	−0	7	6.5	16	0	46	6.4
29	1	58	13.8	6	+0	2	6.2	18	1	2	6.1
31	−2	5	−13.3	8	+0	10	+5.8	20	−1	17	−5.8
eb. 2	2	13	12.8	10	0	19	5.4	22	1	32	5.5
4	2	20	12.3	12	0	28	5.0	24	1	47	5.2
6	2	26	11.8	14	0	37	4.6	26	2	2	4.8
8	2	32	11.2	16	0	46	4.2	28	2	16	4.5
10	−2	38	−10.6	18	+0	55	+3.7	30	−2	29	−4.1
12	2	44	10.1	20	1	4	3.2	Nov. 1	2	43	3.8
14	2	49	9.5	22	1	13	2.7	3	2	55	3.4
16	2	53	8.9	24	1	23	2.2	5	3	7	3.0
18	2	58	8.3	26	1	32	1.7	7	3	19	2.6
20	−3	2	− 7.6	28	+1	41	+1.2	9	−3	30	−2.2
22	3	5	7.0	30	1	50	0.6	11	3	40	1.8
24	3	9	6.4	Aug. 1	1	59	+0.1	13	3	50	1.4
26	3	12	5.8	3	2	8	−0.4	15	3	59	1.0
28	3	15	5.3	5	2	17	1.0	17	4	7	0.6
ar. 1	−3	18	− 4.7	7	+2	25	−1.5	19	−4	14	−0.2
	.	. .	. .	9	2	33	2.1	21	4	21	+0.2
	.	. .	. .	11	2	40	2.6	23	4	27	0.6
	.	. .	. .	13	2	47	3.1	25	4	33	1.0
ay 3	−3	4	+ 8.7	15	2	54	3.6	27	4	38	1.5
5	−3	1	+ 8.9	17	+2	59	−4.1	29	−4	42	+1.9
7	2	57	9.1	19	3	4	4.6	Dec. 1	4	46	2.3
9	2	54	9.3	21	3	9	5.0	3	4	49	2.7
11	2	50	9.4	23	3	12	5.5	5	4	51	3.1
13	2	46	9.6	25	3	15	5.9	7	4	53	3.5
15	−2	42	+ 9.7	27	+3	16	−6.2	9	−4	54	+3.9
17	2	38	9.8	29	3	17	6.6	11	4	55	4.3
19	2	33	9.8	31	3	17	6.9	13	4	56	4.7
21	2	29	9.9	Sept. 2	3	16	7.2	15	4	55	5.1
23	2	24	9.9	4	3	13	7.4	17	4	55	5.5
25	−2	19	+ 9.9	6	+3	10	−7.6	19	−4	54	+5.9
27	2	14	9.9	8	3	6	7.8	21	4	52	6.2
29	2	9	9.8	10	3	0	8.0	23	4	50	6.6
31	2	3	9.8	12	2	54	8.1	25	4	48	6.9
ne 2	1	58	9.7	14	2	46	8.2	27	4	46	7.2
4	−1	52	+ 9.6	16	+2	38	−8.3	29	−4	43	+7.5
6	−1	46	+ 9.6	18	+2	29	−8.3	31	−4	39	+7.8

GREENWICH MEAN TIME.

JANUARY.

d	h	m	s	
1	3	30	0	II. Oc. D.
	8	53	52	II. Ec. R.
	11	26	11	I.* Oc. D.
	14	57	9	I.* Ec. R.
2	7	38	14	III. Tr. I.
	8	36	9	I. Tr. I.
	9	52	41	I. Sh. I.
	10	40	15	III.* Tr. E.
	10	50	24	I.* Tr. E.
	12	5	28	I.* Sh. E.
	12	59	18	III.* Sh. I.
	15	39	47	III. Sh. E.
	22	39	17	II. Tr. I.
3	1	11	52	II. Sh. I.
	1	25	35	II. Tr. E.
	3	54	7	II. Sh. E.
	5	55	50	I. Oc. D.
	9	26	2	I. Ec. R.
	13	20	26	IV.* Oc. D.
	16	35	9	IV. Oc. R.
4	2	13	42	IV. Ec. D.
	3	5	46	I. Tr. I.
	3	34	21	IV. Ec. R.
	4	21	36	I. Sh. I.
	5	20	2	I. Tr. E.
	6	34	24	I. Sh. E.
	16	52	20	II. Oc. D.
	22	13	26	II. Ec. R
5	0	25	27	I. Oc. D.
	3	54	53	I. Ec. R.
	21	35	33	I. Tr. I.
	21	49	13	III. Oc. D.
	22	50	39	I. Sh. I.
	23	49	51	I. Tr. E.
6	0	52	52	III. Oc. R.
	1	3	27	I. Sh. E.
	3	3	14	III. Ec. D.
	5	45	14	III. Ec. R.
	12	0	48	II.* Tr. I.
	14	30	9	II.* Sh. I.
	14	47	1	II.* Tr. E.
	17	12	18	II. Sh. E.
	18	55	9	I. Oc. D.
	22	23	44	I. Ec. R.
7	16	5	17	I. Tr. I.
	17	19	36	I. Sh. I.
	18	19	36	I. Tr. E.
	19	32	24	I. Sh. E.
8	6	14	32	II. Oc. D.
	11	32	19	II.* Ec. R.
	13	24	52	I.* Oc. D.
	16	52	33	I. Ec. R.
9	10	35	9	I.* Tr. I.
9	11	48	38	I.* Sh. I.
	11	53	56	III.* Tr. I.
	12	49	29	I.* Tr. E.
	14	1	27	I.* Sh. E.
	14	55	27	III. Tr. E.
	17	2	25	III. Sh. I.
	19	41	39	III. Sh. E.
10	1	22	34	II. Tr. I.
	3	48	26	II. Sh. I.
	4	8	44	II. Tr. E.
	6	30	29	II. Sh. E.
	7	54	41	I. Oc. D.
	11	21	25	I.* Ec. R.
11	5	4	57	I. Tr. I.
	6	17	32	I. Sh. I.
	7	19	19	I. Tr. E.
	8	30	23	I. Sh. E.
	19	37	45	II. Oc. D.
12	0	49	29	IV. Tr. I.
	0	51	56	II. Ec. R.
	2	24	29	I. Oc. D.
	3	56	42	IV. Tr. E.
	5	50	14	I. Ec. R.
	13	22	38	IV.* Sh. I.
	14	13	48	IV.* Sh. E.
	23	34	56	I. Tr. I.
13	0	46	35	I. Sh. I.
	1	49	19	I. Tr. E.
	2	6	21	III. Oc. D.
	2	59	26	I. Sh. E.
	5	9	10	III. Oc. R.
	7	5	43	III. Ec. D.
	9	46	22	III. Ec. R.
	14	44	42	II. Tr. I.
	17	6	40	II. Sh. I.
	17	30	46	II. Tr. E.
	19	48	38	II. Sh. E.
	20	54	21	I. Oc. D.
14	0	19	5	I. Ec. R.
	18	4	51	I. Tr. I.
	19	15	31	I. Sh. I.
	20	19	16	I. Tr. E.
	21	28	23	I. Sh. E.
15	9	0	43	II. Oc. D.
	14	10	47	II.* Ec. R.
	15	24	14	I. Oc. D.
	18	47	53	I. Ec. R.
16	12	34	54	I.* Tr. I.
	13	44	33	I.* Sh. I.
	14	49	19	I. Tr. E.
	15	57	26	I. Sh. E.
	16	12	55	III. Tr. I.
	19	13	40	III. Tr. E.
	21	5	30	III. Sh. I.
16	23	43	31	III. Sh. E.
17	4	7	3	II. Tr. I.
	6	24	52	II. Sh. I.
	6	53	6	II. Tr. E.
	9	6	44	II. Sh. E.
	9	54	13	I. Oc. D.
	13	16	43	I.* Ec. R.
18	7	4	52	I. Tr. I.
	8	13	29	I. Sh. I.
	9	19	18	I. Tr. E.
	10	26	21	I. Sh. E.
	22	24	45	II. Oc. D.
19	3	30	29	II. Ec. R.
	4	24	10	I. Oc. D.
	7	45	33	I. Ec. R.
20	1	35	1	I. Tr. I.
	2	42	30	I. Sh. I.
	3	49	28	I. Tr. E.
	4	55	25	I. Sh. E.
	6	26	11	III. Oc. D.
	9	6	6	IV. Oc. D.
	9	27	57	III. Oc. R.
	11	7	59	III.* Ec. D.
	12	12	59	IV.* Oc. R.
	13	47	17	III.* Ec. R.
	17	29	42	II. Tr. I.
	19	43	2	II. Sh. I.
	20	15	41	II. Tr. E.
	20	48	11	IV. Ec. D.
	21	32	26	IV. Ec. R.
	22	24	47	II. Sh. E.
	22	54	11	I. Oc. D.
21	2	14	22	I. Ec. R.
	20	5	6	I. Tr. I.
	21	11	26	I. Sh. I.
	22	19	33	I. Tr. E.
	23	24	22	I. Sh. E.
22	11	48	27	II.* Oc. D.
	16	49	21	II. Ec. R.
	17	24	10	I. Oc. D.
	20	43	10	I. Ec. R.
23	14	35	17	I. Tr. I.
	15	40	27	I. Sh. I.
	16	49	47	I. Tr. E.
	17	53	24	I. Sh. E.
	20	35	30	III. Tr. I.
	23	35	15	III. Tr. E.
24	1	9	15	III. Sh. I.
	3	46	2	III. Sh. E.
	6	52	37	II. Tr. I.
	9	1	10	II. Sh. I.
	9	38	32	II. Tr. E.
	11	42	49	II.* Sh. E.
24	11	54	19	I.* Oc. D.
	15	11	59	I. Ec. R.
25	9	5	24	I. Tr. I.
	10	9	21	I. Sh. I.
	11	19	54	I.* Tr. E.
	12	22	19	I.* Sh. E.
26	1	13	12	II. Oc. D.
	6	9	4	II. Ec. R.
	6	24	24	I. Oc. D.
	9	40	47	I. Ec. R.
27	3	35	42	I. Tr. I.
	4	38	23	I. Sh. I.
	5	50	13	I. Tr. E.
	6	51	22	I. Sh. E.
	10	48	46	III. Oc. D.
	13	49	16	III.* Oc. R.
	15	10	21	III. Ec. D.
	17	48	18	III. Ec. R.
	20	15	47	II. Tr. I.
	22	19	14	II. Sh. I.
	23	1	38	II. Tr. E.
28	0	54	32	I. Oc. D.
	1	0	50	II. Sh. E.
	4	9	35	I. Ec. R.
	20	56	28	IV. Tr. I.
	22	5	55	I. Tr. I.
	23	7	19	I. Sh. I.
	23	53	4	IV. Tr. E.
29	0	20	27	I. Tr. E.
	1	20	19	I. Sh. E.
	14	37	29	II. Oc. D.
	19	24	41	I. Oc. D.
	19	27	55	II. Ec. R.
	22	38	22	I. Ec. R.
30	16	36	15	I. Tr. I.
	17	36	21	I. Sh. I.
	18	50	48	I. Tr. E.
	19	49	20	I. Sh. E.
31	1	0	0	III. Tr. I.
	3	58	33	III. Tr. E.
	5	12	22	III. Sh. I.
	7	47	56	III. Sh. E.
	9	39	13	II. Tr. I.
	11	37	19	II.* Sh. I.
	12	24	58	II.* Tr. E.
	13	54	54	I. Oc. D.
	14	18	51	II. Sh. E.
	17	7	10	I. Ec. R.

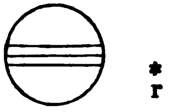
NOTE.—I. denotes ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., occultation; Tr., transit of the satellite; Sh., transit of the shadow. *Visible at Washington.

GREENWICH MEAN TIME.

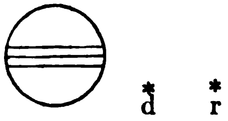
JANUARY.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

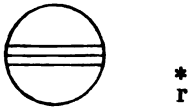
I.



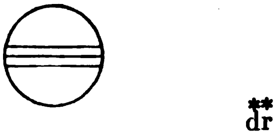
III.



II.



IV.



Configurations at 11ʰ 55ᵐ for an Inverting Telescope.

Day.	West.		East.
1	·4	○	·2 3· ·1●
2	·4 1· 3·	○	2·
3	3· 2· ·	○	4 ·1
4	·3 1··2	○	·4
5	·3	○	·1 ·2 ·4
6	·1 2	○	· ·3 ·4
7	·2	○	1· ·3 ·4
8	·1	○	·2 3· 4·
9	○1· 3	○	· 2· 4·
10	3· 2·	○	·1 4·
11	·3 1· ·2	○	4·
12	·3 4·	○	·1 ·2
13	4· ·1	○	2· ·3
14	4· 2·	○	1· ·3
15	4· ·1	○	3· ·2●
16	·4 1	○	·3· 2·
17	·4 3· 2·	○	·1●
18	·43· ·2 1·	○	
19	·3 ·4	○	·1 ·2
20	1·	○	2· ·3● ·4●
21	2·	○	1· ·4 ·3
22	·1	○	3· ·4 ·2●
23		○	1· 3· 2· ·4
24	3· 2· ·	○	1 ·4
25	3· ·2 1·	○	4·
26	·3	○	·1 ·2 4·
27	1·	○	2· 4· ·3●
28	2·	○	4· ·1 ·3
29	4· ·1 ·2	○	3·
30	4·	○	1· 3· ·2
31	○2· 4· 3· ·1	○	

GREENWICH MEAN TIME.

FEBRUARY.

d h m s	
1 11 6 30	I.* Tr. I.
12 5 13	I.* Sh. I.
13 21 4	I.* Tr. E.
14 18 14	I. Sh. E.
2 4 2 52	II. Oc. D.
8 25 7	I. Oc. D.
8 47 38	II. Ec. R.
11 35 58	I.* Ec. R.
3 5 36 57	I. Tr. I.
6 34 15	I. Sh. I.
7 51 30	I. Tr. E.
8 47 17	I. Sh. E.
15 14 8	III. Oc. D.
18 13 9	III. Oc. R.
19 13 11	III. Ec. D.
21 49 46	III. Ec. R.
23 2 49	II. Tr. I.
4 0 55 17	II. Sh. I.
1 48 29	II. Tr. E.
2 55 21	I. Oc. D.
3 36 45	II. Sh. E.
6 4 44	I. Ec. R.
5 0 7 15	I. Tr. I.
1 3 9	I. Sh. I.
2 21 50	I. Tr. E.
3 16 12	I. Sh. E.
17 27 44	II. Oc. D.
21 25 36	I. Oc. D.
22 6 30	II. Ec. R.
6 0 33 30	I. Ec. R.
5 27 27	IV. Oc. D.
8 20 28	IV. Oc. R.
18 37 42	I. Tr. I.
19 32 9	I. Sh. I.
20 52 18	I. Tr. E.
21 45 13	I. Sh. E.
7 5 26 42	III. Tr. I.
8 23 46	III. Tr. E.
9 15 19	III. Sh. I.
11 49 39	III.* Sh. E.
12 26 37	II.* Tr. I.
14 13 15	II. Sh. I.
15 12 11	II. Tr. E.
15 55 55	I. Oc. D.
16 54 38	II. Sh. E.
19 2 17	I. Ec. R.
8 13 8 5	I.* Tr. I.
14 1 2	I. Sh. I.
8 15 22 40	I. Tr. E.
16 14 7	I. Sh. E.
9 6 53 39	II. Oc. D.
10 26 14	I. Oc. D.
11 26 14	II.* Ec. R.
13 31 3	I. Ec. R.
10 7 38 36	I. Tr. I.
8 30 3	I. Sh. I.
9 53 12	I. Tr. E.
10 43 8	I. Sh. E.
19 41 21	III. Oc. D.
22 38 38	III. Oc. R.
23 15 42	III. Ec. D.
11 1 50 35	II. Tr. I.
1 50 54	III. Ec. R.
3 31 11	II. Sh. I.
4 36 4	II. Tr. E.
4 56 33	I. Oc. D.
6 12 30	II. Sh. E.
7 59 48	I. Ec. R.
12 2 9 2	I. Tr. I.
2 58 59	I. Sh. I.
4 23 38	I. Tr. E.
5 12 4	I. Sh. E.
20 18 58	II. Oc. D.
23 26 53	I. Oc. D.
13 0 45 4	II. Ec. R.
2 28 32	I. Ec. R.
20 39 35	I. Tr. I.
21 27 56	I. Sh. I.
22 54 12	I. Tr. E.
23 41 3	I. Sh. E.
14 9 54 48	III. Tr. I.
12 50 13	III.* Tr. E.
13 17 49	III. Sh. I.
15 14 45	II. Tr. I.
15 50 54	III. Sh. E.
16 49 7	II. Sh. I.
17 35 41	IV. Tr. I.
17 57 16	I. Oc. D.
18 0 7	II. Tr. E.
19 30 24	II. Sh. E.
20 14 57	IV. Tr. E.
20 57 19	I. Ec. R.
15 15 10 2	I. Tr. I.
15 56 48	I. Sh. I.
17 24 39	I. Tr. E.
18 9 56	I. Sh. E.
16 9 45 19	II. Oc. D.
12 27 40	I.* Oc. D.
14 4 46	II. Ec. R.
15 26 4	I. Ec. R.
17 9 40 39	I. Tr. I.
10 25 48	I. Sh. I.
11 55 15	I.* Tr. E.
12 38 56	I.* Sh. E.
18 0 10 43	III. Oc. D.
3 6 4	III. Oc. R.
3 18 35	III. Ec. D.
4 39 2	II. Tr. I.
5 52 25	III. Ec. R.
6 7 0	II. Sh. I.
6 58 3	I. Oc. D.
7 24 17	II. Tr. E.
8 48 13	II. Sh. E.
9 54 48	I. Ec. R.
19 4 11 10	I. Tr. I.
4 54 43	I. Sh. I.
6 25 46	I. Tr. E.
7 7 49	I. Sh. E.
23 11 1	II. Oc. D.
20 1 28 27	I. Oc. D.
3 23 34	II. Ec. R.
4 23 31	I. Ec. R.
22 41 48	I. Tr. I.
23 23 39	I. Sh. I.
21 0 56 24	I. Tr. E.
1 36 49	I. Sh. E.
14 24 28	III. Tr. I.
17 17 59	III. Tr. E.
17 20 14	III. Sh. I.
18 3 28	II. Tr. I.
19 24 51	II. Sh. I.
19 52 3	III. Sh. E.
19 58 55	I. Oc. D.
20 48 35	II. Tr. E.
22 6 1	II. Sh. E.
22 52 16	I. Ec. R.
22 17 12 20	I. Tr. I.
17 52 30	I. Sh. I.
19 26 55	I. Tr. E.
20 5 40	I. Sh. E.
23 2 16 30	IV. Oc. D.
4 48 29	IV. Oc. R.
12 37 45	II.* Oc. D.
14 29 22	I. Oc. D.
23 16 43 17	II. Ec. R.
17 21 1	I. Ec. R.
24 11 43 0	I.* Tr. I.
12 21 29	I.* Sh. I.
13 57 35	I. Tr. E.
14 34 39	I. Sh. E.
25 4 40 48	III. Oc. D.
7 28 3	II. Tr. I.
8 42 41	II. Sh. I.
8 59 49	I. Oc. D.
9 53 6	III. Ec. R.
10 13 2	II. Tr. E.
11 23 46	II. Sh. E.
11 49 44	I.* Ec. R.
26 6 13 36	I. Tr. I.
6 50 21	I. Sh. I.
8 28 9	I. Tr. E.
9 3 31	I. Sh. E.
27 2 3 45	II. Oc. D.
3 30 15	I. Oc. D.
6 2 3	II. Ec. R.
6 18 25	I. Ec. R.
28 0 44 18	I. Tr. I.
1 19 19	I. Sh. I.
2 58 50	I. Tr. E.
3 32 29	I. Sh. E.
18 55 58	III. Tr. I.
20 52 41	II. Tr. I.
21 23 6	III. Sh. I.
21 47 22	III. Tr. E.
22 0 28	II. Sh. I.
22 0 45	I. Oc. D.
23 37 31	II. Tr. E.
23 53 38	III. Sh. E.
29 0 41 28	II. Sh. E.
0 47 8	I. Ec. R.
19 14 54	I. Tr. I.
19 48 8	I. Sh. I.
21 29 24	I. Tr. E.
22 1 19	I. Sh. E.

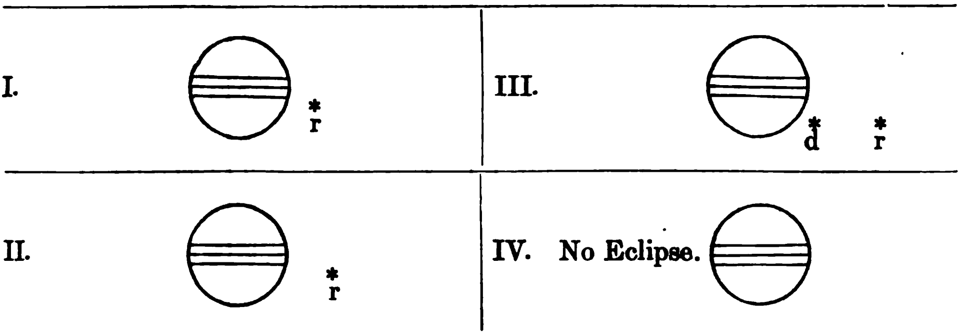
By reason of the proximity of Jupiter to the Sun the phenomena of the satellites are not given for March and April.

Note.—I. denotes ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., occultation; Tr., transit of the satellite; Sh., transit of the shadow. *Visible at Washington.

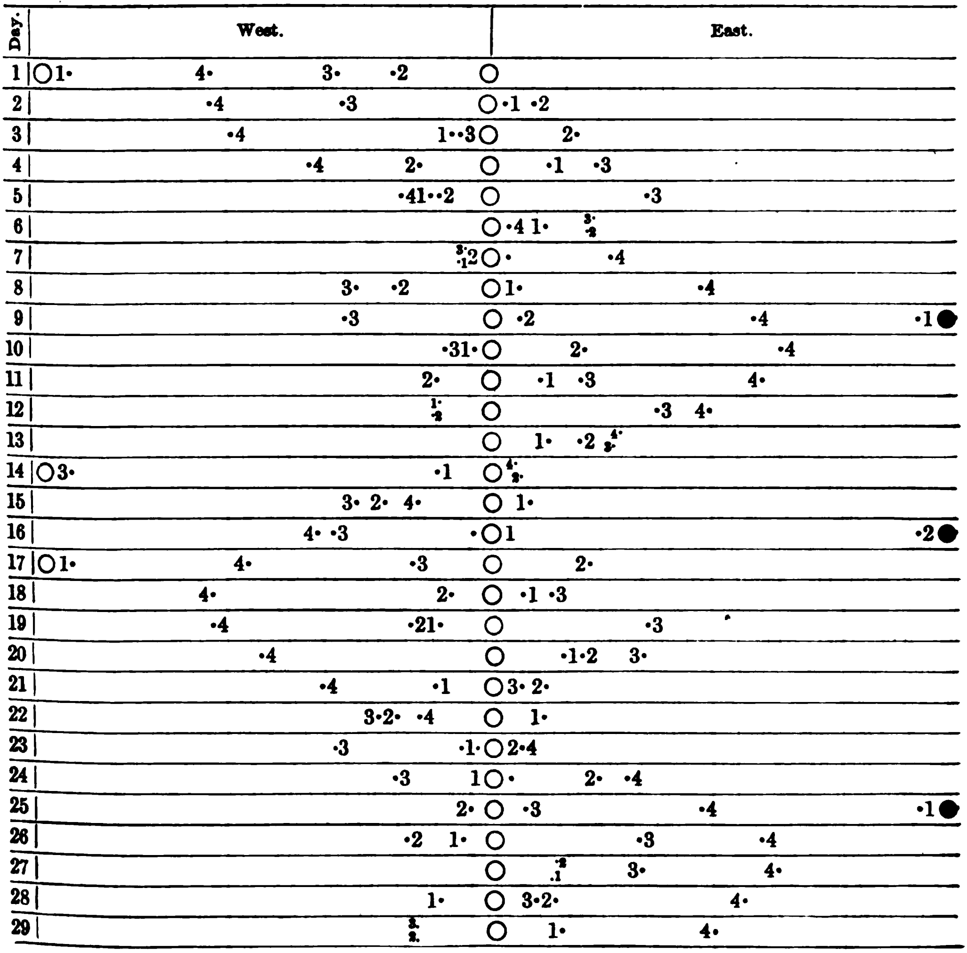
GREENWICH MEAN TIME.

FEBRUARY.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 11ʰ 40ᵐ for an Inverting Telescope.



SATELLITES OF JUPITER, 1916.

GREENWICH MEAN TIME.

MAY.

d	h	m	s		
1	0	0	25	I.	Oc. R.
	3	1	14	II.	Ec. D.
	6	46	53	II.	Oc. R.
	18	36	31	I.	Sh. I.
	19	8	19	I.	Tr. I.
	20	48	44	I.	Sh. E.
	21	20	46	I.	Tr. E.
2	15	45	56	I.	Ec. D.
	18	30	42	I.	Oc. R.
	21	18	41	II.	Sh. I.
	22	23	40	II.	Tr. I.
	23	57	57	II.	Sh. E.
3	1	3	48	II.	Tr. E.
	9	45	23	III.	Sh. I.
	11	58	55	III.	Tr. I.
	12	3	14	III.	Sh. E.
	13	5	9	I.	Sh. I.
	13	38	42	I.	Tr. I.
	14	22	2	III.	Tr. E.
	15	17	20	I.	Sh. E.
	15	51	3	I.	Tr. E.
4	10	14	32	I.	Ec. D.
	13	1	1	I.	Oc. R.
	16	20	18	II.	Ec. D.
	20	12	40	II.	Oc. R.
5	7	33	55	I.	Sh. I.
	8	9	11	I.	Tr. I.
	9	46	1	I.	Sh. E.
	10	21	26	I.	Tr. E.
6	4	43	5	I.	Ec. D.
	7	31	15	I.	Oc. R.
	10	36	24	II.	Sh. I.
	11	48	15	II.	Tr. I.
	13	15	33	II.	Sh. E.
	14	28	12	II.	Tr. E.
	23	38	28	III.	Ec. D.
7	1	57	10	III.	Ec. R.
	2	2	34	I.	Sh. I.
	2	6	30	III.	Oc. D.
	2	39	34	I.	Tr. I.
	4	14	38	I.	Sh. E.
	4	28	56	III.	Oc. R.
	4	51	43	I.	Tr. E.
	23	11	39	I.	Ec. D.
8	2	1	31	I.	Oc. R.
	5	38	36	II.	Ec. D.
	9	37	38	II.	Oc. R.
	20	31	21	I.	Sh. I.
	21	10	2	I.	Tr. I.
	22	43	20	I.	Sh. E.
	23	22	5	I.	Tr. E.
9	17	40	12	I.	Ec. D.
	20	31	43	I.	Oc. R.
9	23	54	6	II.	Sh. I.
10	1	12	55	II.	Tr. I.
	2	33	7	II.	Sh. E.
	3	52	32	II.	Tr. E.
	13	47	14	III.	Sh. I.
	14	59	58	I.	Sh. I.
	15	40	21	I.	Tr. I.
	16	3	36	III.	Sh. E.
	16	30	19	III.	Tr. I.
	17	11	54	I.	Sh. E.
	17	52	18	I.	Tr. E.
	18	49	25	III.	Tr. E.
11	12	8	47	I.	Ec. D.
	15	1	58	I.	Oc. R.
	18	57	30	II.	Ec. D.
	23	2	57	II.	Oc. R.
12	9	28	42	I.	Sh. I.
	10	10	44	I.	Tr. I.
	11	40	34	I.	Sh. E.
	12	22	35	I.	Tr. E.
13	6	37	20	I.	Ec. D.
	9	32	7	I.	Oc. R.
	13	11	54	II.	Sh. I.
	14	37	26	II.	Tr. I.
	15	50	47	II.	Sh. E.
	17	16	41	II.	Tr. E.
14	3	40	21	III.	Ec. D.
	3	57	21	I.	Sh. I.
	4	41	1	I.	Tr. I.
	5	57	41	III.	Ec. R.
	6	9	9	I.	Sh. E.
	6	37	9	III.	Oc. D.
	6	52	45	I.	Tr. E.
	8	55	41	III.	Oc. R.
15	1	5	53	I.	Ec. D.
	4	2	16	I.	Oc. R.
	8	15	45	II.	Ec. D.
	12	27	33	II.	Oc. R.
	22	26	5	I.	Sh. I.
	23	11	21	I.	Tr. I.
16	0	37	50	I.	Sh. E.
	1	23	0	I.	Tr. E.
	19	34	25	I.	Ec. D.
	22	32	25	I.	Oc. R.
17	2	29	41	II.	Sh. I.
	4	1	54	II.	Tr. I.
	5	8	26	II.	Sh. E.
	6	40	46	II.	Tr. E.
	16	54	41	I.	Sh. I.
	17	41	35	I.	Tr. I.
	17	49	1	III.	Sh. I.
	19	6	23	I.	Sh. E.
	19	53	7	I.	Tr. E.
17	20	3	53	III.	Sh. E.
	21	0	15	III.*	Tr. I.
	23	15	12	III.	Tr. E.
18	14	3	0	I.	Ec. D.
	17	2	35	I.	Oc. R.
	21	34	32	II.	Ec. D.
19	1	52	23	II.	Oc. R.
	11	23	23	I.	Sh. I.
	12	11	51	I.	Tr. I.
	13	35	1	I.	Sh. E.
	14	23	17	I.	Tr. E.
20	8	31	32	I.	Ec. D.
	11	32	39	I.	Oc. R.
	15	47	25	II.	Sh. I.
	17	26	6	II.	Tr. I.
	18	26	2	II.	Sh. E.
	20	4	35	II.	Tr. E.
21	5	52	0	I.	Sh. I.
	6	42	2	I.	Tr. I.
	7	41	52	III.	Ec. D.
	8	3	34	I.	Sh. E.
	8	53	21	I.	Tr. E.
	9	57	50	III.	Ec. R.
	11	6	8	III.	Oc. D.
	13	20	39	III.	Oc. R.
22	3	0	5	I.	Ec. D.
	6	2	44	I.	Oc. R.
	10	52	42	II.	Ec. D.
	15	16	31	II.	Oc. R.
23	0	20	43	I.	Sh. I.
	1	12	16	I.	Tr. I.
	2	32	13	I.	Sh. E.
	3	23	29	I.	Tr. E.
	21	28	37	I.	Ec. D.
24	0	32	45	I.	Oc. R.
	5	5	18	II.	Sh. I.
	6	50	19	II.	Tr. I.
	7	43	46	II.	Sh. E.
	9	28	26	II.	Tr. E.
	18	49	18	I.	Sh. I.
	19	42	22	I.	Tr. I.
	21	0	45	I.*	Sh. E.
	21	50	24	III.	Sh. I.
	21	53	28	I.	Tr. E.
25	0	3	45	III.	Sh. E.
	1	28	29	III.	Tr. I.
	3	39	9	III.	Tr. E.
	15	57	11	I.	Ec. D.
	19	2	49	I.	Oc. R.
26	0	11	21	II.	Ec. D.
	4	40	48	II.	Oc. R.
	13	17	59	I.	Sh. I.
26	14	12	31	I.	Tr. I.
	15	29	21	I.	Sh. E.
	16	23	31	I.	Tr. E.
27	10	25	41	I.	Ec. D.
	13	32	47	I.	Oc. R.
	18	28	4	II.	Sh. I.
	20	14	11	II.	Tr. I.
	21	1	24	II.*	Sh. E.
	22	51	55	II.	Tr. E.
28	7	46	35	I.	Sh. I.
	8	42	34	I.	Tr. I.
	9	57	53	I.	Sh. E.
	10	53	27	I.	Tr. E.
	11	43	43	III.	Ec. D.
	13	58	19	III.	Ec. R.
	15	33	58	III.	Oc. D.
	17	44	20	III.	Oc. R.
29	4	54	14	I.	Ec. D.
	8	2	46	I.	Oc. R.
	13	29	29	II.	Ec. D.
	18	4	26	II.	Oc. R.
30	2	15	16	I.	Sh. I.
	3	12	40	I.	Tr. I.
	4	26	30	I.	Sh. E.
	5	23	27	I.	Tr. E.
	23	22	45	I.	Ec. D.
31	2	32	41	I.	Oc. R.
	7	41	1	II.	Sh. I.
	9	38	7	II.	Tr. I.
	10	19	12	II.	Sh. E.
	12	15	27	II.	Tr. E.
	20	43	50	I.*	Sh. I.
	21	42	38	I.	Tr. I.
	22	55	1	I.	Sh. E.
	23	53	19	I.	Tr. E.

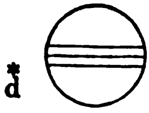
NOTE.—I. denotes ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., occultation; Tr., transit of the satellite; Sh., transit of the shadow. *Visible at Washington.

GREENWICH MEAN TIME.

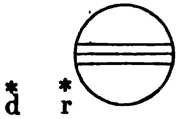
MAY.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

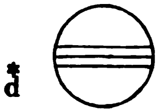
I.



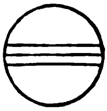
III.



II.



IV. No Eclipse.



Configurations at 20ʰ 40ᵐ for an Inverting Telescope.

Day.	West.		East.
1	○1•	○	•2 •4 3•
2		○	2••1 3• •4
3	2• 1• $^{3\cdot}$	○	•4
4	3•	○	•2 •1 •4
5	•3 •1	○	2• 4•
6	2• •3	○	1• 4•
7	•2 •1	○	•3 4•
8	1	○	•4• •2 •3
9	4•	○	•12• 3•
10	4• 2• 1•3•	○	
11	4• 3•	○	•1 •2 ●
12	4• •3 1•	○	2•
13	•4 •32•	○	1•
14	•4 •2 •1	○	•3
15	•4	○	1• •2 •3
16	•4	○	2• 3• •1 ●
17	2• 1•^{3}	○	•4
18	3• •2	○	•1 •4
19	•3 1•	○	•2 •4
20	•3 2•	○	•1 •4
21	•2 •1	○	•3 4•
22		○	1••2 •3 4•
23	•1	○	2• 3• 4•
24	○1• 2•	○	3• 4•
25	3• •24	○	• •1
26	3• 4• 1•	○	•2
27	○2• 4• •3	○	•1
28	4• •2 •1	○	•3
29	4•	○	•21• •3
30	•4 •1	○	2• 3•
31	•4 2•	○	1• 3•

GREENWICH MEAN TIME.

JUNE.

d	h	m	s	
1	1	51	42	III. Sh. I.
	4	3	33	III. Sh. E.
	5	55	2	III. Tr. I.
	8	1	17	III. Tr. E.
	17	51	19	I. Ec. D.
	21	2	38	I.* Oc. R.
2	2	47	57	II. Ec. D.
	7	28	9	II. Oc. R.
	15	12	29	I. Sh. I.
	16	12	39	I. Tr. I.
	17	23	36	I. Sh. E.
	18	23	12	I. Tr. E.
3	12	19	49	I. Ec. D.
	15	32	29	I. Oc. R.
	20	58	45	II.* Sh. I.
	23	1	34	II. Tr. I.
	23	36	49	II. Sh. E.
4	1	38	30	II. Tr. E.
	9	41	3	I. Sh. I.
	10	42	34	I. Tr. I.
	11	52	6	I. Sh. E.
	12	53	1	I. Tr. E.
	15	44	47	III. Ec. D.
	17	58	3	III. Ec. R.
	19	59	16	III.* Oc. D.
	22	5	23	III. Oc. R.
5	6	48	22	I. Ec. D.
	10	2	21	I. Oc. R.
	16	5	58	II. Ec. D.
	20	51	12	II.* Oc. R.
6	4	9	44	I. Sh. I.
	5	12	32	I. Tr. I.
	6	20	42	I. Sh. E.
	7	22	52	I. Tr. E.
7	1	16	51	I. Ec. D.
	4	32	8	I. Oc. R.
	10	16	46	II. Sh. I.
	12	25	6	II. Tr. I.
	12	54	42	II. Sh. E.
	15	1	39	II. Tr. E.
	22	38	17	I. Sh. I.
	23	42	21	I. Tr. I.
8	0	49	11	I. Sh. E.
	1	52	35	I. Tr. E.
	5	53	28	III. Sh. I.
	8	3	49	III. Sh. E.
	10	20	15	III. Tr. I.
	12	21	57	III. Tr. E.
	19	45	25	I.* Ec. D.
	23	1	58	I. Oc. R.
9	5	24	21	II. Ec. D.
	10	14	16	II. Oc. R.
	17	6	55	I. Sh. I.
9	18	12	12	I. Tr. I.
	19	17	45	I. Sh. E.
	20	22	20	I.* Tr. E.
10	14	13	55	I. Ec. D.
	17	31	41	I. Oc. R.
	23	34	36	II. Sh. I.
11	1	48	7	II. Tr. I.
	2	12	23	II. Sh. E.
	4	24	15	II. Tr. E.
	11	35	28	I. Sh. I.
	12	41	57	I. Tr. I.
	13	46	14	I. Sh. E.
	14	51	59	I. Tr. E.
	19	45	44	III.* Ec. D.
	21	57	40	III. Ec. R.
12	0	22	28	III. Oc. D.
	2	24	12	III. Oc. R.
	8	42	28	I. Ec. D.
	12	1	25	I. Oc. R.
	18	42	16	II. Ec. D.
	23	36	42	II. Oc. R.
13	6	4	7	I. Sh. I.
	7	11	46	I. Tr. I.
	8	14	48	I. Sh. E.
	9	21	41	I. Tr. E.
14	3	10	56	I. Ec. D.
	6	31	4	I. Oc. R.
	12	52	42	II. Sh. I.
	15	11	14	II. Tr. I.
	15	30	20	II. Sh. E.
	17	46	56	II. Tr. E.
15	0	32	38	I. Sh. I.
	1	41	26	I. Tr. I.
	2	43	16	I. Sh. E.
	3	51	14	I. Tr. E.
	9	55	0	III. Sh. I.
	12	3	54	III. Sh. E.
	14	43	2	III. Tr. I.
	16	40	6	III. Tr. E.
	21	39	30	I. Ec. D.
16	1	0	46	I. Oc. R.
	8	0	31	II. Ec. D.
	12	59	2	II. Oc. R.
	19	1	14	I. Sh. I.
	20	11	7	I.* Tr. I.
	21	11	48	I.* Sh. E.
	22	20	49	I. Tr. E.
17	16	8	0	I. Ec. D.
	19	30	20	I.* Oc. R.
18	2	10	33	II. Sh. I.
	4	33	44	II. Tr. I.
	4	48	3	II. Sh. E.
18	7	9	1	II. Tr. E.
	13	29	47	I. Sh. I.
	14	40	43	I. Tr. I.
	15	40	16	I. Sh. E.
	16	50	19	I. Tr. E.
	23	46	36	III. Ec. D.
19	1	57	13	III. Ec. R.
	4	43	28	III. Oc. D.
	6	40	38	III. Oc. R.
	10	36	32	I. Ec. D.
	13	59	56	I. Oc. R.
	21	18	23	II. Ec. D.
20	2	20	49	II. Oc. R.
	7	58	24	I. Sh. I.
	9	10	21	I. Tr. I.
	10	8	49	I. Sh. E.
	11	19	50	I. Tr. E.
21	5	5	1	I. Ec. D.
	8	29	25	I. Oc. R.
	15	28	41	II. Sh. I.
	17	56	20	II. Tr. I.
	18	6	4	II. Sh. E.
	20	31	12	II.* Tr. E.
22	2	26	54	I. Sh. I.
	3	39	53	I. Tr. I.
	4	37	16	I. Sh. E.
	5	49	14	I. Tr. E.
	13	57	6	III. Sh. I.
	16	4	33	III. Sh. E.
	19	3	57	III.* Tr. I.
	20	56	16	III.* Tr. E.
	23	33	35	I. Ec. D.
23	2	58	57	I. Oc. R.
	10	36	31	II. Ec. D.
	15	42	25	II. Oc. R.
	20	55	29	I.* Sh. I.
	22	9	23	I. Tr. I.
	23	5	47	I. Sh. E.
24	0	18	39	I. Tr. E.
	18	2	4	I. Ec. D.
	21	28	22	I. Oc. R.
25	4	46	35	II. Sh. I.
	7	18	16	II. Tr. I.
	7	23	50	II. Sh. E.
	9	52	43	II. Tr. E.
	15	24	1	I. Sh. I.
	16	38	47	I. Tr. I.
	17	34	14	I. Sh. E.
	18	47	57	I.* Tr. E.
26	3	47	39	III. Ec. D.
	5	56	56	III. Ec. R.
	9	2	12	III. Oc. D.
	10	54	41	III. Oc. R.
26	12	30	36	I. Ec
	15	57	49	I. Oc
	23	54	18	II. Ec
27	5	3	27	II. Oc
	9	52	36	I. Sh
	11	8	13	I. Tr.
	12	2	46	I. Sh
	13	17	18	I. Tr.
28	6	59	5	I. Ec
	10	27	7	I. Oc
	18	4	49	II. Sh
	20	40	19	II.* Tr.
	20	41	56	II.* Sh
	23	14	21	II. Tr.
29	4	21	5	I. Sh
	5	37	32	I. Tr.
	6	31	12	I. Sh
	7	46	31	I. Tr.
	17	58	30	III. Sh
	20	4	31	III.* Sh
	23	21	31	III. Tr.
30	1	9	0	III. Tr.
	1	27	38	I. Ec
	4	56	30	I. Oc
	13	12	17	II. Ec
	18	24	13	II.* Oc
	22	49	37	I. Sh

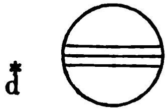
NOTE.—I. denotes ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., occultat
Tr., transit of the satellite; Sh., transit of the shadow. *Visible at Washington.

GREENWICH MEAN TIME.

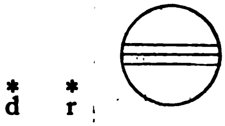
JUNE.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

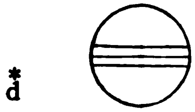
I.



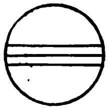
III.



II.



IV. No Eclipse.



Configurations at 19ʰ 55ᵐ for an Inverting Telescope.

Day.	West.		East.
1	•4 3••2	○	•1 ●
2	3• •4 1•	○	•2
3	•3	○	2• •4 •1
4	2• 1•	•○	3 .4
5		○	1• •3 •4 •2 ●
6	•1	○	2• 3• •4
7	2•	○	1• 3• 4•
8	•2 3•	○	4• •1 ●
9	○ 1• 3•	○	•2 4•
10	•3	○	•12• 4•
11	2• 1•	.4 ○	•3 ●
12	4•	○	•1 •3 •2 ●
13	4• •1	○	2• •3
14	4• 2•	○	1• 3•
15	4• •2 3• •1	○	
16	•4 3•	1○•	•2
17	•4 •3	○	•1 2•
18	•4 2• •31•	○	
19	•2 •4	○	•1 •3
20	1•	○	•4 •2 •3
21	○ 2•	○	1• 3• •4
22	○ 3• •2 •1	○	•4
23	3•	○	1••2 •4
24	•3	○	2• 4• •1 ●
25	2• •3 1•	○	4•
26	•2	○	•1•3 4•
27	1•	○	4• •2 •3
28	4• 2	○•	•1 3•
29	4• •2 •1	○	3•
30	4• 3•	○	•21•

GREENWICH MEAN TIME.

JULY.

d	h	m	s	
1	0	6	51	I. Tr. I.
	0	59	42	I. Sh. E.
	2	15	44	I. Tr. E.
	19	56	7	I.* Ec. D.
	23	25	44	I. Oc. R.
2	7	22	43	II. Sh. I.
	9	59	43	II. Sh. E.
	10	1	34	II. Tr. I.
	12	35	12	II. Tr. E.
	17	18	7	I. Sh. I.
	18	36	4	I.* Tr. I.
	19	28	8	I.* Sh. E.
	20	44	52	I.* Tr. E.
3	7	49	15	III. Ec. D.
	9	57	13	III. Ec. R.
	13	18	45	III. Oc. D.
	14	24	40	I. Ec. D.
	15	6	24	III. Oc. R.
	17	55	0	I. Oc. R.
4	2	30	1	II. Ec. D.
	5	8	12	II. Ec. R.
	5	10	9	II. Oc. D.
	7	44	29	II. Oc. R.
	11	46	40	I. Sh. I.
	13	5	19	I. Tr. I.
	13	56	39	I. Sh. E.
	15	14	1	I. Tr. E.
5	8	53	8	I. Ec. D.
	12	24	7	I. Oc. R.
	20	41	3	II.* Sh. I.
	23	17	56	II. Sh. E.
	23	23	0	II. Tr. I.
6	1	56	14	II. Tr. E.
	6	15	9	I. Sh. I.
	7	34	26	I. Tr. I.
	8	25	4	I. Sh. E.
	9	43	2	I. Tr. E.
	21	59	38	III. Sh. I.
7	0	4	17	III. Sh. E.
	3	21	42	I. Ec. D.
	3	35	54	III. Tr. I.
	5	18	22	III. Tr. E.
	6	53	19	I. Oc. R.
	15	47	53	II. Ec. D.
	18	25	53	II. Ec. R.
	18	30	29	II.* Oc. D.
	21	4	23	II.* Oc. R.
8	0	43	40	I. Sh. I.
	2	3	32	I. Tr. I.
	2	53	32	I. Sh. E.
	4	12	3	I. Tr. E.
	21	50	11	I. Ec. D.
9	1	22	21	I. Oc. R.
9	9	58	56	II. Sh. I.
	12	35	43	II. Sh. E.
	12	43	28	II. Tr. I.
	15	16	19	II. Tr. E.
	19	12	9	I.* Sh. I.
	20	32	36	I.* Tr. I.
	21	21	58	I. Sh. E.
	22	41	1	I. Tr. E.
10	11	50	29	III. Ec. D.
	13	57	9	III. Ec. R.
	16	18	44	I. Ec. D.
	17	31	46	III. Oc. D.
	19	14	27	III.* Oc. R.
	19	51	26	I.* Oc. R.
11	5	5	34	II. Ec. D.
	7	43	23	II. Ec. R.
	7	50	22	II. Oc. D.
	10	23	48	II. Oc. R.
	13	40	41	I. Sh. I.
	15	1	35	I. Tr. I.
	15	50	27	I. Sh. E.
	17	9	55	I. Tr. E.
12	10	47	12	I. Ec. D.
	14	20	21	I. Oc. R.
	23	17	22	II. Sh. I.
13	1	54	3	II. Sh. E.
	2	4	10	II. Tr. I.
	4	36	39	II. Tr. E.
	8	9	9	I. Sh. I.
	9	30	29	I. Tr. I.
	10	18	52	I. Sh. E.
	11	38	44	I. Tr. E.
14	2	0	25	III. Sh. I.
	4	3	43	III. Sh. E.
	5	15	46	I. Ec. D.
	7	46	48	III. Tr. I.
	8	49	20	I. Oc. R.
	9	24	9	III. Tr. E.
	18	23	19	II.* Ec. D.
	21	0	57	II.* Ec. R.
	21	9	47	II.* Oc. D.
	23	42	48	II. Oc. R.
15	2	37	38	I. Sh. I.
	3	59	22	I. Tr. I.
	4	47	19	I. Sh. E.
	6	7	32	I. Tr. E.
	23	44	15	I. Ec. D.
16	3	18	10	I. Oc. R.
	12	35	19	II. Sh. I.
	15	11	54	II. Sh. E.
	15	23	51	II. Tr. I.
	17	55	57	II.* Tr. E.
	21	6	6	I.* Sh. I.
	22	28	9	I. Tr. I.
16	23	15	44	I. Sh. E.
17	0	36	15	I. Tr. E.
	15	52	3	III. Ec. D.
	17	57	27	III.* Ec. R.
	18	12	48	I.* Ec. D.
	21	41	40	III. Oc. D.
	21	47	2	I. Oc. R.
	23	19	19	III. Oc. R.
18	7	40	54	II. Ec. D.
	10	18	23	II. Ec. R.
	10	28	41	II. Oc. D.
	13	1	16	II. Oc. R.
	15	34	37	I. Sh. I.
	16	56	59	I. Tr. I.
	17	44	12	I.* Sh. E.
	19	4	57	I.* Tr. E.
19	12	41	16	I. Ec. D.
	16	15	44	I. Oc. R.
20	1	53	50	II. Sh. I.
	4	30	19	II. Sh. E.
	4	43	46	II. Tr. I.
	7	15	29	II. Tr. E.
	10	3	3	I. Sh. I.
	11	25	37	I. Tr. I.
	12	12	37	I. Sh. E.
	13	33	34	I. Tr. E.
21	6	1	8	III. Sh. I.
	7	9	51	I. Ec. D.
	8	3	7	III. Sh. E.
	10	44	30	I. Oc. R.
	11	54	11	III. Tr. I.
	13	26	19	III. Tr. E.
	20	58	35	II.* Ec. D.
	23	35	53	II. Ec. R.
	23	47	10	II. Oc. D.
22	2	19	19	II. Oc. R.
	4	31	32	I. Sh. I.
	5	54	16	I. Tr. I.
	6	41	3	I. Sh. E.
	8	2	8	I. Tr. E.
23	1	38	20	I. Ec. D.
	5	13	7	I. Oc. R.
	15	11	48	II. Sh. I.
	17	48	12	II.* Sh. E.
	18	2	34	II.* Tr. I.
	20	33	54	II.* Tr. E.
	22	59	58	I. Sh. I.
24	0	22	49	I. Tr. I.
	1	9	28	I. Sh. E.
	2	30	37	I. Tr. E.
	19	52	54	III.* Ec. D.
	20	6	55	I.* Ec. D.
	21	57	2	III. Ec. R.
24	23	41	45	I. Oc. R.
25	1	47	12	III. Oc. D.
	3	19	42	III. Oc. R.
	10	16	7	II. Ec. D.
	12	53	17	II. Ec. R.
	13	5	6	II. Oc. D.
	15	36	51	II. Oc. R.
	17	28	28	I.* Sh. I.
	18	51	22	I.* Tr. I.
	19	37	55	I.* Sh. E.
	20	59	6	I.* Tr. E.
26	14	35	22	I. Ec. D.
	18	10	13	I.* Oc. R.
27	4	30	21	II. Sh. I.
	7	6	42	II. Sh. E.
	7	21	35	II. Tr. I.
	9	52	34	II. Tr. E.
	11	56	54	I. Sh. I.
	13	19	48	I. Tr. I.
	14	6	19	I. Sh. E.
	15	27	28	I. Tr. E.
28	9	3	58	I. Ec. D.
	10	2	22	III. Sh. I.
	12	3	5	III. Sh. E.
	12	38	46	I. Oc. R.
	15	58	21	III. Tr. I.
	17	25	7	III.* Tr. E.
	23	33	43	II. Ec. D.
29	2	10	41	II. Ec. R.
	2	22	32	II. Oc. D.
	4	53	52	II. Oc. R.
	6	25	21	I. Sh. I.
	7	48	11	I. Tr. I.
	8	34	45	I. Sh. E.
	9	55	48	I. Tr. E.
30	3	32	27	I. Ec. D.
	7	7	8	I. Oc. R.
	17	48	22	II.* Sh. I.
	20	24	40	II.* Sh. E.
	20	39	26	II.* Tr. I.
	23	10	5	II. Tr. E.
31	0	53	46	I. Sh. I.
	2	16	32	I. Tr. I.
	3	3	9	I. Sh. E.
	4	24	6	I. Tr. E.
	22	1	2	I. Ec. D
	23	53	40	III. Ec. D.

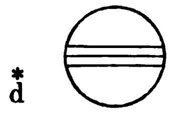
NOTE.—I. denotes ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., occultation. Tr., transit of the satellite; Sh., transit of the shadow. *Visible at Washington.

GREENWICH MEAN TIME.

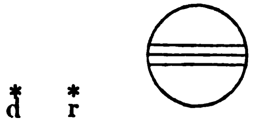
JULY.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

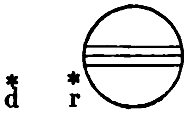
I.



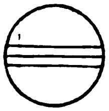
III.



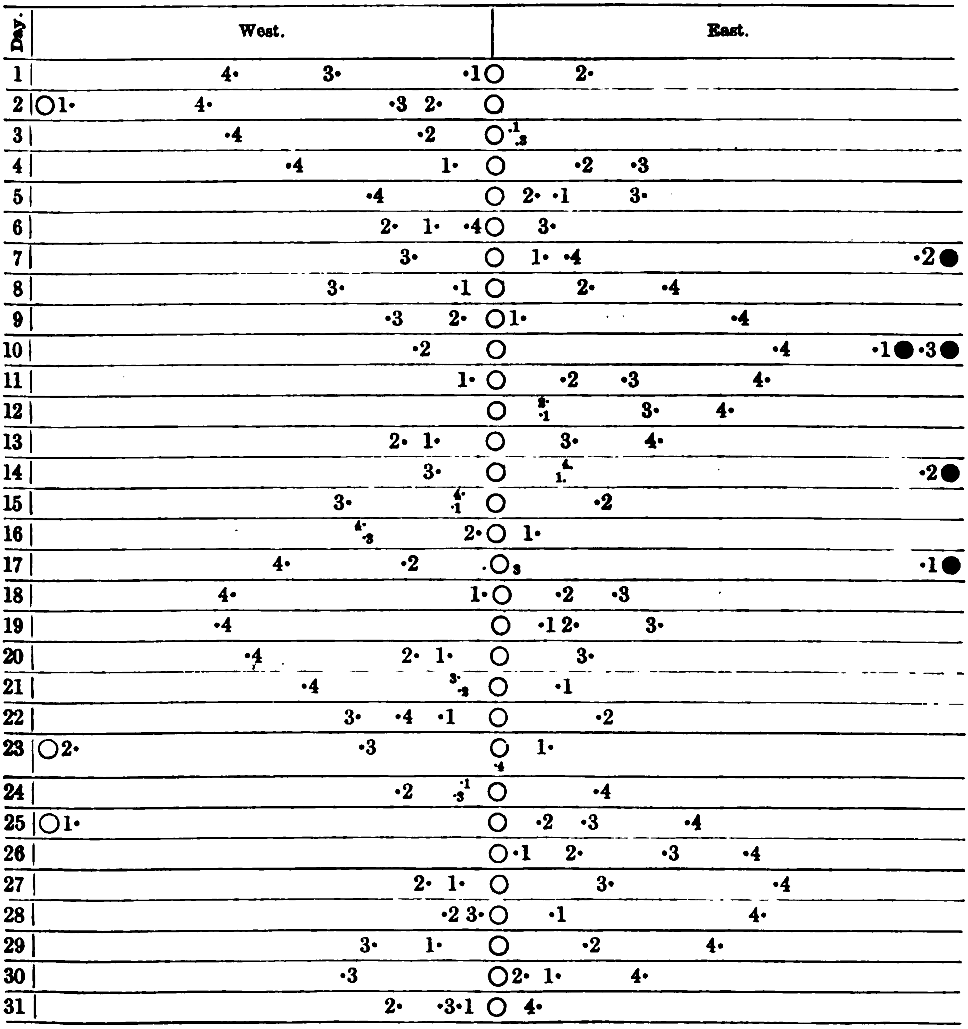
II.



IV. No Eclipse.



Configurations at 19h 10m for an Inverting Telescope.



GREENWICH MEAN TIME.

AUGUST.

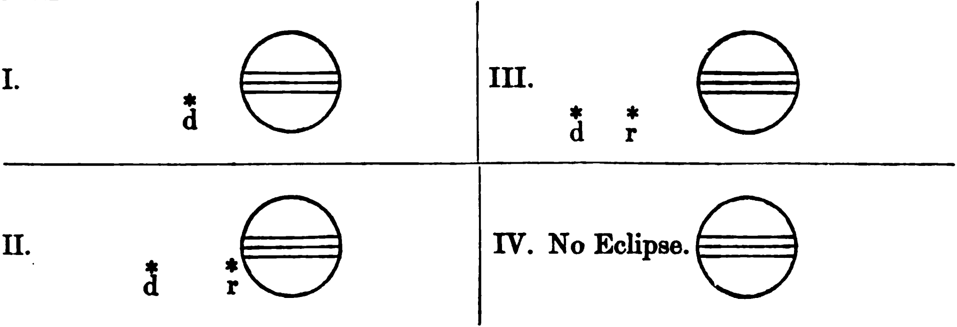
d	h	m	s	
1	1	35	34	I. Oc. R.
	1	56	34	III. Ec. R.
	5	48	39	III. Oc. D.
	7	15	55	III. Oc. R.
	12	51	12	II. Ec. D.
	15	28	1	II. Ec. R.
	15	39	24	II. Oc. D.
	18	10	23	II.* Oc. R.
	19	22	15	I.* Sh. I.
	20	44	48	I.* Tr. I.
	21	31	36	I.* Sh. E.
	22	52	18	I. Tr. E.
2	16	29	30	I.* Ec. D.
	20	3	47	I.* Oc. R.
3	7	7	3	II. Sh. I.
	9	43	16	II. Sh. E.
	9	57	30	II. Tr. I.
	12	27	50	II. Tr. E.
	13	50	41	I. Sh. I.
	15	12	57	I. Tr. I.
	16	0	1	I. Sh. E.
	17	20	24	I.* Tr. E.
4	10	58	6	I. Ec. D.
	14	3	23	III. Sh. I.
	14	32	2	I. Oc. R.
	16	2	53	III. Sh. E.
	19	58	2	III.* Tr. I.
	21	19	24	III.* Tr. E.
5	2	8	41	II. Ec. D.
	4	45	20	II. Ec. R.
	4	55	43	II. Oc. D.
	7	26	17	II. Oc. R.
	8	19	6	I. Sh. I.
	9	41	4	I. Tr. I.
	10	28	25	I. Sh. E.
	11	48	28	I. Tr. E.
6	5	26	36	I. Ec. D.
	9	0	9	I. Oc. R.
	20	25	5	II.* Sh. I.
	23	1	16	II. Sh. E.
	23	14	19	II. Tr. I.
7	1	44	21	II. Tr. E.
	2	47	31	I. Sh. I.
	4	9	6	I. Tr. I.
	4	56	49	I. Sh. E.
	6	16	27	I. Tr. E.
	23	55	11	I. Ec. D.
8	3	28	18	I. Oc. R.
	3	54	27	III. Ec. D.
	5	56	7	III. Ec. R.
	9	45	57	III. Oc. D.
	11	7	53	III. Oc. R.
	15	26	9	II. Ec. D.
	18	2	39	II.* Ec. R.
8	18	11	30	II.* Oc. D.
	20	41	44	II.* Oc. R.
	21	15	59	I.* Sh. I.
	22	37	6	I. Tr. I.
	23	25	15	I. Sh. E.
9	0	44	25	I. Tr. E.
	18	23	39	I.* Ec. D.
	21	56	14	I. Oc. R.
10	9	43	50	II. Sh. I.
	12	19	58	II. Sh. E.
	12	31	20	II. Tr. I.
	15	1	5	II. Tr. E.
	15	44	24	I. Sh. I.
	17	5	1	I.* Tr. I.
	17	53	40	I.* Sh. E.
	19	12	17	I.* Tr. E.
11	12	52	16	I. Ec. D.
	16	24	16	I.* Oc. R.
	18	4	56	III.* Sh. I.
	20	3	18	III.* Sh. E.
	23	53	47	III. Tr. I.
12	1	9	49	III. Tr. E.
	4	43	35	II. Ec. D.
	7	19	55	II. Ec. R.
	7	26	41	II. Oc. D.
	9	56	34	II. Oc. R.
	10	12	49	I. Sh. I.
	11	32	52	I. Tr. I.
	12	22	5	I. Sh. E.
	13	40	6	I. Tr. E.
13	7	20	46	I. Ec. D.
	10	52	7	I. Oc. R.
	23	1	53	II. Sh. I.
14	1	37	59	II. Sh. E.
	1	46	59	II. Tr. I.
	4	16	28	II. Tr. E.
	4	41	13	I. Sh. I.
	6	0	37	I. Tr. I.
	6	50	29	I. Sh. E.
	8	7	50	I. Tr. E.
15	1	49	22	I. Ec. D.
	5	19	59	I. Oc. R.
	7	55	29	III. Ec. D.
	9	55	56	III. Ec. R.
	13	38	59	III. Oc. D.
	14	55	36	III. Oc. R.
	18	1	0	II.* Ec. D.
	20	37	12	II.* Ec. R.
	20	41	21	II.* Oc. D.
	23	9	40	I. Sh. I.
	23	10	53	II. Oc. R.
16	0	28	21	I. Tr. I.
	1	18	55	I. Sh. E.
16	2	35	32	I. Tr. E.
	20	17	52	I.* Ec. D.
	23	47	40	I. Oc. R.
17	12	20	42	II. Sh. I.
	14	56	48	II. Sh. E.
	15	2	59	II. Tr. I.
	17	32	14	II.* Tr. E.
	17	38	4	I.* Sh. I.
	18	55	59	I.* Tr. I.
	19	47	20	I.* Sh. E.
	21	3	8	I.* Tr. E.
18	14	46	30	I. Ec. D.
	18	15	25	I.* Oc. R.
	22	5	51	III. Sh. I.
19	0	3	6	III. Sh. E.
	3	44	17	III. Tr. I.
	4	54	59	III. Tr. E.
	7	18	22	II. Ec. D.
	9	54	24	II. Ec. R.
	9	55	21	II. Oc. D.
	12	6	29	I. Sh. I.
	12	24	34	II. Oc. R.
	13	23	32	I. Tr. I.
	14	15	45	I. Sh. E.
	15	30	41	I.* Tr. E.
20	9	15	1	I. Ec. D.
	12	42	59	I. Oc. R.
21	1	38	48	II. Sh. I.
	4	14	54	II. Sh. E.
	4	17	33	II. Tr. I.
	6	34	53	I. Sh. I.
	6	46	36	II. Tr. E.
	7	51	0	I. Tr. I.
	8	44	8	I. Sh. E.
	9	58	8	I. Tr. E.
22	3	43	38	I. Ec. D.
	7	10	35	I. Oc. R.
	11	57	10	III. Ec. D.
	13	56	24	III. Ec. R.
	17	27	55	III.* Oc. D.
	18	39	20	III.* Oc. R.
	20	35	45	II.* Ec. D.
23	1	3	19	I. Sh. I.
	1	37	39	II. Oc. R.
	2	18	27	I. Tr. I.
	3	12	35	I. Sh. E.
	4	25	33	I. Tr. E.
	22	12	8	I. Ec. D.
24	1	37	59	I. Oc. R.
	14	57	39	II. Sh. I.
	17	32	30	II.* Tr. I.
	17	33	50	II.* Sh. E.
	19	31	43	I.* Sh. I.
24	20	1	23	II.* Tr. E.
	20	45	47	I.* Tr. I.
	21	41	0	I.* Sh. E.
	22	52	53	I. Tr. E.
25	16	40	47	I.* Ec. D.
	20	5	27	I.* Oc. R.
26	2	6	33	III. Sh. I.
	4	2	47	III. Sh. E.
	7	29	40	III. Tr. I.
	8	35	24	III. Tr. E.
	9	53	6	II. Ec. D.
	14	0	8	I. Sh. I.
	14	50	11	II. Oc. R.
	15	13	3	I.* Tr. I.
	16	9	25	I.* Sh. E.
	17	20	9	I.* Tr. E.
27	11	9	19	I. Ec. D.
	14	32	45	I. Oc. R.
28	4	15	50	II. Sh. I.
	6	45	51	II. Tr. I.
	6	51	56	II. Sh. E.
	8	28	34	I. Sh. I.
	9	14	33	II. Tr. E.
	9	40	15	I. Tr. I.
	10	37	50	I. Sh. E.
	11	47	20	I. Tr. E.
29	5	37	57	I. Ec. D.
	9	0	3	I. Oc. R.
	15	58	30	III.* Ec. D.
	17	56	33	III.* Ec. R.
	21	11	22	III.* Oc. D.
	22	17	56	III. Oc. R.
	23	10	29	II. Ec. D.
30	2	56	59	I. Sh. I.
	4	2	12	II. Oc. R.
	4	7	23	I. Tr. I.
	5	6	17	I. Sh. E.
	6	14	29	I. Tr. E.
31	0	6	28	I. Ec. D.
	3	27	11	I. Oc. R.
	17	34	49	II.* Sh. I.
	19	59	29	II.* Tr. I.
	20	10	56	II.* Sh. E.
	21	25	23	I.* Sh. I.
	22	28	4	II. Tr. E.
	22	34	27	I. Tr. I.
	23	34	43	I. Sh. E.

NOTE.—I. denotes ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., occultation; Tr., transit of the satellite; Sh., transit of the shadow. *Visible at Washington.

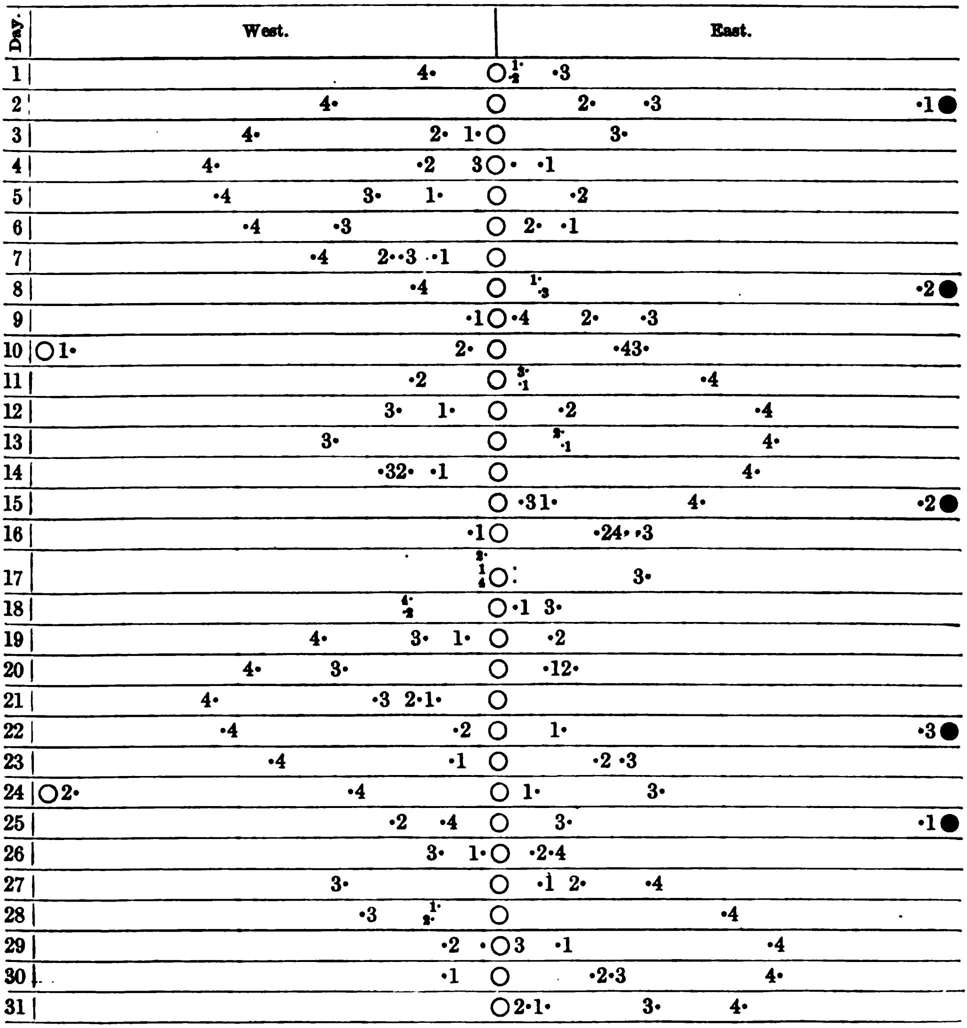
GREENWICH MEAN TIME.

AUGUST.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 18ʰ 25ᵐ for an Inverting Telescope.



GREENWICH MEAN TIME.

SEPTEMBER.

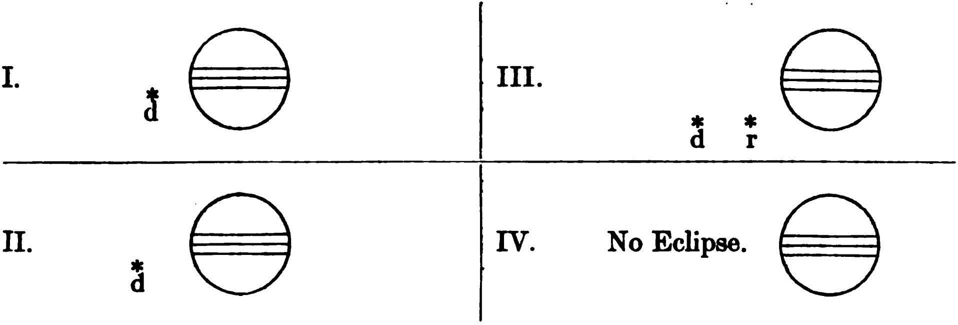
d	h	m	s	
1	0	41	32	I. Tr. E.
	18	35	8	I.* Ec. D.
	21	54	22	I.* Oc. R.
2	6	7	2	III. Sh. I.
	8	2	13	III. Sh. E.
	11	9	54	III. Tr. I.
	12	10	52	III. Tr. E.
	12	27	48	II. Ec. D.
	15	53	47	I.* Sh. I.
	17	1	25	I.* Tr. I.
	17	13	36	II.* Oc. R.
	18	3	8	I.* Sh. E.
	19	8	31	I.* Tr. E.
3	13	3	41	I. Ec. D.
	16	21	23	I.* Oc. R.
4	6	53	1	II. Sh. I.
	9	11	40	II. Tr. I.
	9	29	9	II. Sh. E.
	10	22	11	I. Sh. I.
	11	28	19	I. Tr. I.
	11	40	8	II. Tr. E.
	12	31	34	I. Sh. E.
	13	35	26	I. Tr. E.
5	7	32	20	I. Ec. D.
	10	48	26	I. Oc. R.
	20	0	13	III.* Ec. D.
	21	57	9	III.* Ec. R.
6	0	49	56	III. Oc. D.
	1	45	10	II. Ec. D.
	1	52	21	III. Oc. R.
	4	50	38	I. Sh. I.
	5	55	11	I. Tr. I.
	6	24	27	II. Oc. R.
	7	0	1	I. Sh. E.
	8	2	19	I. Tr. E.
7	2	0	52	I. Ec. D.
	5	15	17	I. Oc. R.
	20	12	6	II.* Sh. I.
	22	24	9	II. Tr. I.
	22	48	15	II. Sh. E.
	23	19	3	I. Sh. I.
8	0	21	57	I. Tr. I.
	0	52	33	II. Tr. E.
	1	28	28	I. Sh. E.
	2	29	7	I. Tr. E.
	20	29	34	I.* Ec. D.
	23	42	12	I. Oc. R.
9	10	7	34	III. Sh. I.
	12	1	45	III. Sh. E.
	14	45	0	III.* Tr. I.
	15	2	30	II.* Ec. D.
	15	41	56	III.* Tr. E.
	17	47	28	I.* Sh. I.
	18	48	40	I.* Tr. I.
9	19	34	45	II.* Oc. R.
	19	56	55	I.* Sh. E.
	20	55	51	I.* Tr. E.
10	14	58	8	I.* Ec. D.
	18	8	56	I.* Oc. R.
11	9	30	20	II. Sh. I.
	11	35	10	II. Tr. I.
	12	6	30	II. Sh. E.
	12	15	53	I. Sh. I.
	13	15	18	I. Tr. I.
	14	3	31	II.* Tr. E.
	14	25	20	I.* Sh. E.
	15	22	28	I.* Tr. E.
12	9	26	47	I. Ec. D.
	12	35	43	I. Oc. R.
13	0	1	18	III. Ec. D.
	1	57	7	III. Ec. R.
	4	19	53	II. Ec. D.
	4	22	44	III. Oc. D.
	5	21	49	III. Oc. R.
	6	44	20	I. Sh. I.
	7	41	54	I. Tr. I.
	8	44	34	II. Oc. R.
	8	53	49	I. Sh. E.
	9	49	6	I. Tr. E.
14	3	55	23	I. Ec. D.
	7	2	18	I. Oc. R.
	22	49	29	II. Sh. I.
15	0	46	30	II. Tr. I.
	1	12	46	I. Sh. I.
	1	25	40	II. Sh. E.
	2	8	25	I. Tr. I.
	3	14	50	II. Tr. E.
	3	22	17	I. Sh. E.
	4	15	38	I. Tr. E.
	22	24	5	I. Ec. D.
16	1	28	57	I. Oc. R.
	14	8	45	III.* Sh. I.
	16	1	57	III.* Sh. E.
	17	37	14	II.* Ec. D.
	18	15	39	III.* Tr. I.
	19	9	35	III.* Tr. E.
	19	41	12	I.* Sh. I.
	20	34	52	I.* Tr. I.
	21	50	45	I.* Sh. E.
	21	53	51	II.* Oc. R.
	22	42	7	I. Tr. E.
17	16	52	41	I.* Ec. D.
	19	55	27	I.* Oc. R.
18	12	7	48	II. Sh. I.
	13	56	26	II.* Tr. I.
	14	9	38	I.* Sh. I.
	14	43	59	II.* Sh. E.
18	15	1	15	I.* Tr. I.
	16	19	12	I.* Sh. E.
	16	24	46	II.* Tr. E.
	17	8	32	I.* Tr. E.
19	11	21	23	I. Ec. D.
	14	21	59	I.* Oc. R.
20	4	2	22	III. Ec. D.
	5	57	8	III. Ec. R.
	6	54	36	II. Ec. D.
	7	50	27	III. Oc. D.
	8	38	6	I. Sh. I.
	8	47	28	III. Oc. R.
	9	27	35	I. Tr. I.
	10	47	42	I. Sh. E.
	11	2	39	II. Oc. R.
	11	34	54	I. Tr. E.
21	5	49	58	I. Ec. D.
	8	48	21	I. Oc. R.
22	1	27	6	II. Sh. I.
	3	6	34	I. Sh. I.
	3	6	45	II. Tr. I.
	3	53	52	I. Tr. I.
	4	3	16	II. Sh. E.
	5	16	11	I. Sh. E.
	5	35	8	II. Tr. E.
	6	1	13	I. Tr. E.
23	0	18	42	I. Ec. D.
	3	14	47	I. Oc. R.
	18	9	47	III.* Sh. I.
	20	2	3	III.* Sh. E.
	20	11	58	II.* Ec. D.
	21	35	1	I.* Sh. I.
	21	41	2	III.* Tr. I.
	22	20	4	I.* Tr. I.
	22	33	28	III. Tr. E.
	23	44	40	I. Sh. E.
24	0	11	0	II. Oc. R.
	0	27	28	I. Tr. E.
	18	47	20	I.* Ec. D.
	21	41	3	I.* Oc. R.
25	14	45	28	II.* Sh. I.
	16	3	29	I.* Sh. I.
	16	15	40	II.* Tr. I.
	16	46	13	I.* Tr. I.
	17	21	38	II.* Sh. E.
	18	13	8	I.* Sh. E.
	18	44	8	II.* Tr. E.
	18	53	39	I.* Tr. E.
26	13	16	3	I.* Ec. D.
	16	7	23	I.* Oc. R.
27	8	3	34	III. Ec. D.
	9	29	24	II. Ec. D.
	9	57	14	III. Ec. R.
27	10	31	59	I. Sh
	11	12	21	I. Tr.
	11	13	35	III. Oc.
	12	9	56	III. Oc.
	12	41	40	I. Sh.
	13	18	57	II.* Oc.
	13	19	50	I.* Tr.
28	7	44	40	I. Ec.
	10	33	32	I. Oc.
29	4	4	48	II. Sh.
	5	0	28	I. Sh.
	5	25	1	II. Tr.
	5	38	26	I. Tr.
	6	40	57	II. Sh.
	7	10	11	I. Sh.
	7	45	58	I. Tr.
	7	53	35	II. Tr.
30	2	13	26	I. Ec.
	4	59	46	I. Oc.
	22	11	30	III.* Sh.
	22	46	48	II. Ec.
	23	28	57	I. Sh.

NOTE.—I. denotes ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., occultati Tr., transit of the satellite; Sh., transit of the shadow. *Visible at Washington.

GREENWICH MEAN TIME.

SEPTEMBER.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 17ʰ 40ᵐ for an Inverting Telescope.

Day.	West.		East.
1	2· ·1	○	3· 4·
2	○1· 3·	○	·2 4·
3	3· 4·	○	·1 2·
4	·34· 2· 1·	○	
5	4· ·2 ·3	○	·1
6	4· 1·	○	·2 ·3
7	4·	○	2· 1· ·3
8	·4 2· ·1	○	3·
9	·4 3·	○	1· ·2●
10	3··4	○	2· ·1●
11	·3 1· 2· ·	○	4
12	·2 ·3	○	·1 ·4
13	1·	○	·2 ·3 ·4
14		○	2· 1· ·3 ·4
15	2· ·1	○	3· ·4
16	3	○	· 1· 4· ·2●
17	3·	○	·2 4· ·1●
18	·3 1· 2·	○	4·
19	·2 ·3	○	·14·
20	4· 1·	○	·2 .3
21	4·	○	2· ·1 ·3
22	4· 2· ·1	○	3·
23	4· ·2	○	3·1·
24	·4 3· ·1	○	·2
25	○2·○1· ·4 ·3	○	
26	·4 ·2 .3	○	·1
27	·4 1·	○	·2 .3
28		○	·4 ·12· ·3
29	2··1	○	·43·
30	·2	○	3·1· ·4

GREENWICH MEAN TIME.

OCTOBER.

d	h	m	s	
1	0	2	51	III. Sh. E.
	0	4	27	I. Tr. I.
	1	2	23	III. Tr. I.
	1	38	41	I. Sh. E.
	1	55	5	III. Tr. E.
	2	12	0	I. Tr. E.
	2	26	31	II. Oc. R.
	20	42	5	I.* Ec. D.
	23	25	52	I. Oc. R.
2	17	23	14	II.* Sh. I.
	17	57	26	I.* Sh. I.
	18	30	26	I.* Tr. I.
	18	33	5	II.* Tr. I.
	19	59	22	II.* Sh. E.
	20	7	11	I.* Sh. E.
	20	38	2	I.* Tr. E.
	21	1	48	II.* Tr. E.
3	15	10	51	I.* Ec. D.
	17	52	2	I.* Oc. R.
4	12	4	16	II. Ec. D.
	12	5	5	III. Ec. D.
	12	25	59	I.* Sh. I.
	12	56	24	I.* Tr. I.
	13	57	43	III.* Ec. R.
	14	32	45	III.* Oc. D.
	14	35	44	I.* Sh. E.
	15	4	3	I.* Tr. E.
	15	30	8	III.* Oc. R.
	15	33	47	II.* Oc. R.
5	9	39	29	I. Ec. D.
	12	18	2	I.* Oc. R.
6	6	42	41	II. Sh. I.
	6	54	29	I. Sh. I.
	7	22	19	I. Tr. I.
	7	41	42	II. Tr. I.
	9	4	17	I. Sh. E.
	9	18	48	II. Sh. E.
	9	30	1	I. Tr. E.
	10	10	37	II. Tr. E.
7	4	8	16	I. Ec. D.
	6	44	8	I. Oc. R.
8	1	21	44	II. Ec. D.
	1	23	1	I. Sh. I.
	1	48	11	I. Tr. I.
	2	12	44	III. Sh. I.
	3	32	49	I. Sh. E.
	3	55	56	I. Tr. E.
	4	3	10	III. Sh. E.
	4	19	13	III. Tr. I.
	4	40	46	II. Oc. R.
	5	14	7	III. Tr. E.
	22	36	57	I.* Ec. D.
9	1	10	6	I. Oc. R.
	19	51	32	I.* Sh. I.

d	h	m	s	
9	20	1	13	II.* Sh. I.
	20	14	2	I.* Tr. I.
	20	49	8	II.* Tr. I.
	22	1	22	I.* Sh. E.
	22	21	50	I.* Tr. E.
	22	37	16	II.* Sh. E.
	23	18	15	II. Tr. E.
10	17	5	45	I.* Ec. D.
	19	36	10	I.* Oc. R.
11	14	20	6	I.* Sh. I.
	14	39	14	II.* Ec. D.
	14	39	53	I.* Tr. I.
	16	7	20	III.* Ec. D.
	16	29	55	I.* Sh. E.
	16	47	43	I.* Tr. E.
	17	47	32	II.* Oc. R.
	18	49	16	III.* Oc. R.
12	11	34	25	I. Ec. D.
	14	2	4	I.* Oc. R.
13	8	48	40	I. Sh. I.
	9	5	42	I. Tr. I.
	9	20	43	II. Sh. I.
	9	57	14	II. Tr. I.
	10	58	30	I. Sh. E.
	11	13	36	I. Tr. E.
	11	56	42	II.* Sh. E.
	12	26	34	II.* Tr. E.
14	6	3	14	I. Ec. D.
	8	28	4	I. Oc. R.
15	3	17	14	I. Sh. I.
	3	31	29	I. Tr. I.
	3	56	47	II. Ec. D.
	5	27	4	I. Sh. E.
	5	39	26	I. Tr. E.
	6	13	54	III. Sh. I.
	6	54	10	II. Oc. R.
	7	33	1	III. Tr. I.
	8	3	25	III. Sh. E.
	8	31	42	III. Tr. E.
16	0	31	57	I. Ec. D.
	2	53	58	I. Oc. R.
	21	45	48	I.* Sh. I.
	21	57	16	I.* Tr. I.
	22	39	20	II.* Sh. I.
	23	4	14	II. Tr. I.
	23	55	38	I. Sh. E.
17	0	5	15	I. Tr. E.
	1	15	15	II. Sh. E.
	1	33	49	II. Tr. E.
	19	0	47	I.* Ec. D.
	21	19	59	I.* Oc. R.
18	16	14	24	I.* Sh. I.
	16	23	3	I.* Tr. I.

d	h	m	s	
18	17	14	21	II.* Ec. D.
	18	24	14	I.* Sh. E.
	18	31	5	I.* Tr. E.
	20	0	41	II.* Oc. R.
	20	9	16	III.* Ec. D.
	22	7	6	III.* Oc. R.
19	13	29	29	I.* Ec. D.
	15	45	50	I.* Oc. R.
20	10	43	1	I. Sh. I.
	10	48	51	I. Tr. I.
	11	58	56	II.* Sh. I.
	12	12	3	II.* Tr. I.
	12	52	51	I.* Sh. E.
	12	56	55	I.* Tr. E.
	14	34	45	II.* Sh. E.
	14	41	53	II.* Tr. E.
21	7	58	19	I. Ec. D.
	10	11	48	I. Oc. R.
22	5	11	37	I. Sh. I.
	5	14	36	I. Tr. I.
	6	31	59	II. Ec. D.
	7	21	27	I. Sh. E.
	7	22	44	I. Tr. E.
	9	7	11	II. Oc. R.
	10	15	3	III. Sh. I.
	10	44	57	III. Tr. I.
	11	48	35	III.* Tr. E.
	12	3	36	III.* Sh. E.
23	2	27	4	I. Ec. D.
	4	37	42	I. Oc. R.
	23	40	14	I. Sh. I.
	23	40	22	I. Tr. I.
24	1	17	40	II. Sh. I.
	1	18	57	II. Tr. I.
	1	48	32	I. Tr. E.
	1	50	3	I. Sh. E.
	3	49	2	II. Tr. E.
	3	53	23	II. Sh. E.
	20	54	29	I.* Oc. D.
	23	6	49	I. Ec. R.
25	18	6	10	I.* Tr. I.
	18	8	53	I.* Sh. I.
	19	44	48	II.* Oc. D.
	20	14	22	I.* Tr. E.
	20	18	40	I.* Sh. E.
	22	23	28	II.* Ec. R.
26	0	11	35	III. Ec. D.
	2	1	17	III. Ec. R.
	15	20	20	I.* Oc. D.
	17	35	32	I.* Ec. R.
27	12	31	59	I.* Tr. I.
	12	37	32	I.* Sh. I.
	14	26	43	II.* Tr. I.

d	h	m	s	
27	14	37	19	II.* Sh. I.
	14	40	15	I.* Tr. E.
	14	47	19	I.* Sh. E.
	16	57	10	II.* Tr. E.
	17	12	54	II.* Sh. E.
28	9	46	19	I. Oc. D.
	12	4	23	I.* Ec. R.
29	6	57	48	I. Tr. I.
	7	6	10	I. Sh. I.
	8	51	9	II. Oc. D.
	9	6	6	I. Tr. E.
	9	15	56	I. Sh. E.
	11	41	7	II.* Ec. R.
	13	56	25	III.* Tr. I.
	14	16	22	III.* Sh. I.
	15	5	53	III.* Tr. E.
	16	3	57	III.* Sh. E.
30	4	12	12	I. Oc. D.
	6	33	8	I. Ec. R.
31	1	23	38	I. Tr. I.
	1	34	49	I. Sh. I.
	3	31	58	I. Tr. E.
	3	33	44	II. Tr. I.
	3	44	35	I. Sh. E.
	3	56	6	II. Sh. I.
	6	4	29	II. Tr. E.
	6	31	32	II. Sh. E.
	22	38	14	I. Oc. D.

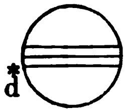
NOTE.—I. denotes ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., occultation; Tr., transit of the satellite; Sh., transit of the shadow. *Visible at Washington.

GREENWICH MEAN TIME.

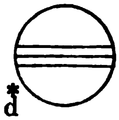
OCTOBER.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

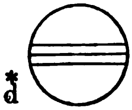
I.



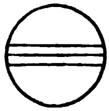
III.



II.



IV. No Eclipse.



Configurations at 16ʰ 40ᵐ for an Inverting Telescope.

Day.	West.		East.
1	3· ·1	O	·2 ·4
2	3·	O	$^{2\cdot}_{1\cdot}$ ·4
3	·32·	O	4· ·1●
4	1·	O ·3	·2 4·
5		O	·1 2· 4··3
6	$^{2\cdot}_{1\cdot}$	O	4· 3·
7	4· ·2	O	$^{3\cdot}_{1\cdot}$
8	4· 3··1	O	·2
9	4· 3·	O	$^{2\cdot}_{1\cdot}$
10	4· ·32· ·	O	1
11	O1· ·4	O	·2● ·3●
12	·4	O	·1 2· ·3
13	·4 $^{2\cdot}_{1\cdot}$	O	3·
14	·2 ·4	O	·13·
15	$^{3\cdot}_{\cdot1}$	O	·4·2
16	3·	O	$^{2\cdot}_{1\cdot}$ ·4
17	·3 2· ·1	O	·4
18	O1· ·3·	O	2 ·4
19		O	·1 $^{2\cdot}_{\cdot3}$ 4·
20	1·2·	O	3· 4·
21	·2	O	·1 3· 4·
22	1· 3·	O	·24·
23	3· 4·	O	$^{2\cdot}_{1\cdot}$
24	·34· 2· ·1	O	
25	4· ·3·2	O	1·
26	4·	O	·3·2 ·1●
27	O2· ·4 1·	O	·3
28	·4 ·2	O	·1 3·
29	·4 1· 3·	O	·2
30	3· ·4	O	1·2·
31	·3 2· ·1	O ·4	

GREENWICH MEAN TIME.

NOVEMBER.

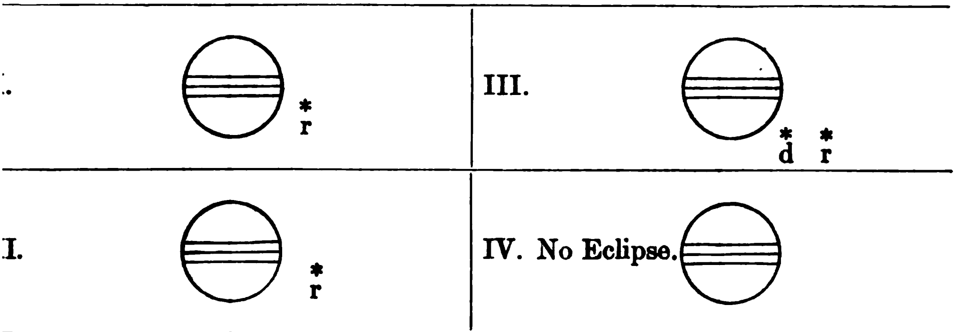
d	h m s		d	h m s		d	h m s		d	h m s	
1	1 2 1	I. Ec. R.	9	18 48 31	I.* Oc. D.	18	1 7 19	II. Sh. E.	27	3 4 49	III. Tr. I.
	19 49 31	I.* Tr. I.		21 26 6	I.* Ec. R.		15 0 3	I.* Oc. D.		4 39 8	III. Tr. E.
	20 3 30	I.* Sh. I.					17 50 27	I.* Ec. R.		6 25 0	III. Sh. I.
	21 57 34	II.* Oc. D.	10	15 59 29	I.* Tr. I.					8 8 46	III. Sh. E.
	21 57 54	I.* Tr. E.		16 26 59	I.* Sh. I.	19	12 10 40	I.* Tr. I.		11 13 0	I.* Oc. D.
	22 13 13	I.* Sh. E.		18 8 3	I.* Tr. E.		12 50 38	I.* Sh. I.		14 14 52	I.* Ec. R.
				18 36 35	I.* Sh. E.		14 19 23	I.* Tr. E.			
2	0 58 46	II. Ec. R.		18 57 53	II.* Tr. I.		15 0 2	I.* Sh. E.	28	8 23 28	I. Tr. I.
	3 28 5	III. Oc. D.		19 54 17	II.* Sh. I.		15 34 8	II.* Oc. D.		9 14 30	I. Sh. I.
	6 2 6	III. Ec. R.		21 29 35	II.* Tr. E.		19 27 50	II.* Ec. R.		10 32 18	I.* Tr. E.
	17 4 10	I.* Oc. D.		22 29 13	II. Sh. E.		23 42 50	III. Tr. I.		11 23 42	I.* Sh. E.
	19 30 46	I.* Ec. R.								12 44 51	II.* Tr. I.
			11	13 14 45	I.* Oc. D.	20	1 11 13	III. Tr. E.		14 30 20	II.* Sh. I.
3	14 15 27	I.* Tr. I.		15 55 0	I.* Ec. R.		2 22 55	III. Sh. I.		15 18 1	II.* Tr. E.
	14 32 11	I.* Sh. I.					4 7 36	III. Sh. E.		17 4 8	II.* Sh. E.
	16 23 52	I.* Tr. E.	12	10 25 36	I. Tr. I.		9 26 28	I. Oc. D.			
	16 41 48	II.* Tr. I.		10 55 41	I.* Sh. I.		12 19 18	I.* Ec. R.	29	5 39 52	I. Oc. D.
	16 41 54	I.* Sh. E.		12 34 12	I.* Tr. E.					8 43 50	I. Ec. R.
	17 15 45	II.* Sh. I.		13 5 14	I.* Sh. E.	21	6 37 5	I. Tr. I.			
	19 12 52	II.* Tr. E.		13 18 25	II.* Oc. D.		7 19 24	I. Sh. I.	30	2 50 14	I. Tr. I.
	19 51 2	II.* Sh. E.		16 52 3	II.* Ec. R.		8 45 50	I. Tr. E.		3 43 17	I. Sh. I.
				20 24 17	III.* Tr. I.		9 28 46	I. Sh. E.		4 59 6	I. Tr. E.
4	11 30 15	I.* Oc. D.		21 46 22	III. Tr. E.		10 24 26	II.* Tr. I.		5 52 27	I. Sh. E.
	13 59 38	I.* Ec. R.		22 20 20	III. Sh. I.		11 51 43	II.* Sh. I.		7 1 24	II. Oc. D.
							12 57 2	II.* Tr. E.		11 21 53	II.* Ec. R.
5	8 41 23	I. Tr. I.	13	0 5 58	III. Sh. E.		14 25 59	II.* Sh. E.		16 43 35	III.* Oc. D.
	9 0 51	I. Sh. I.		7 40 57	I. Oc. D.					18 23 8	III.* Oc. R.
	10 49 50	I.* Tr. E.		10 23 49	I. Ec. R.	22	3 53 3	I. Oc. D.		20 21 59	III. Ec. D.
	11 4 15	II.* Oc. D.					6 48 14	I. Ec. R.		22 7 30	III. Ec. R.
	11 10 32	I.* Sh. E.	14	4 51 47	I. Tr. I.						
	14 16 30	II.* Ec. R.		5 24 24	I. Sh. I.	23	1 3 34	I. Tr. I.			
	17 9 25	III.* Tr. I.		7 0 24	I. Tr. E.		1 48 9	I. Sh. I.			
	18 18 25	III.* Sh. I.		7 33 56	I. Sh. E.		3 12 21	I. Tr. E.			
	18 25 8	III.* Tr. E.		8 6 3	II. Tr. I.		3 57 29	I. Sh. E.			
	20 5 0	III.* Sh. E.		9 13 9	II. Sh. I.		4 42 41	II. Oc. D.			
				10 38 3	II.* Tr. E.		8 45 48	II. Ec. R.			
6	5 56 16	I. Oc. D.		11 47 52	II.* Sh. E.		13 18 29	III.* Oc. D.			
	8 28 26	I. Ec. R.					14 52 25	III.* Oc. R.			
			15	2 7 19	I. Oc. D.		16 19 5	III.* Ec. D.			
7	3 7 22	I. Tr. I.		4 52 44	I. Ec. R.		18 5 24	III.* Ec. R.			
	3 29 33	I. Sh. I.		23 18 1	I. Tr. I.		22 19 35	I. Oc. D.			
	5 15 51	I. Tr. E.		23 53 8	I. Sh. I.						
	5 39 12	I. Sh. E.				24	1 17 4	I. Ec. R.			
	5 49 17	II. Tr. I.	16	1 26 40	I. Tr. E.		19 30 9	I.* Tr. I.			
	6 34 35	II. Sh. I.		2 2 37	I. Sh. E.		20 16 57	I.* Sh. I.			
	8 20 40	II. Tr. E.		2 26 3	II. Oc. D.		21 38 57	I. Tr. E.			
	9 9 42	II. Sh. E.		6 9 54	II. Ec. R.		22 26 14	I. Sh. E.			
				9 58 17	III. Oc. D.		23 34 46	II. Tr. I.			
8	0 22 26	I. Oc. D.		11 26 13	III.* Oc. R.						
	2 57 20	I. Ec. R.		12 16 54	III.* Ec. D.	25	1 11 25	II. Sh. I.			
	21 33 23	I.* Tr. I.		14 4 0	III.* Ec. R.		2 7 40	II. Tr. E.			
	21 58 14	I. Sh. I.		20 33 35	I.* Oc. D.		3 45 27	II. Sh. E.			
	23 41 55	I. Tr. E.		23 21 33	I. Ec. R.		16 46 18	I.* Oc. D.			
							19 46 0	I.* Ec. R.			
9	0 7 53	I. Sh. E.	17	17 44 20	I.* Tr. I.						
	0 11 9	II. Oc. D.		18 21 54	I.* Sh. I.	26	13 56 46	I.* Tr. I.			
	3 34 14	II. Ec. R.		19 53 1	I.* Tr. E.		14 45 43	I.* Sh. I.			
	6 41 52	III. Oc. D.		20 31 21	I.* Sh. E.		16 5 35	I.* Tr. E.			
	8 3 35	III. Oc. R.		21 15 25	II. Tr. I.		16 54 57	I.* Sh. E.			
	8 15 1	III. Ec. D.		22 32 50	II. Sh. I.		17 51 46	II.* Oc. D.			
	10 2 58	III. Ec. R.		23 47 44	II. Tr. E.		22 3 49	II. Ec. R.			

NOTE.—I. denotes ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., occultation. Tr., transit of the satellite: Sh., transit of the shadow. *Visible at Washington.

GREENWICH MEAN TIME.

NOVEMBER.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 15ʰ 25ᵐ for an Inverting Telescope.

Day.	West.		East.
1	•3•2	○	1• •4
2	•1	○	•3 •2 •4
3	○1• 2	○	• •3 •4
4	•2	○	•1 3• •4
5	1• 3	○	••2 4•
6	3•	○	•12• 4•
7	•3 2 .1	○	4•
8	•3•2	○	4•1•
9	4• •1	○	•3 •2
10	4•	○	1•2• •3
11	4• 2•	○	3• •1 ●
12	4• 1•	○	3• •2 ●
13	•4 3•	○	•1 2•
14	•4 3• 1•2•	○	
15	•4 •3 •2	○	1•
16	•4•1	○	•3 •2
17		○	1• •4 2• •3
18	2•	○	•43• •1 ●
19	1••	○	2 3• •4
20	3•	○	•1 2• •4
21	3• 1• 2•	○	4•
22	•3 •2	○	•1 4•
23	•1	○ •3	•2 4•
24		○	1•2• 4• •3
25	2• •1	4• ○	3•
26	○1• 4• •2	○	3•
27	4• 3•	○	•1 •2
28	4• 3• 1• 2•	○	
29	4• •3 •2	○	•1
30	•4 •1 •	○	3 •2

GREENWICH MEAN TIME.

DECEMBER.

d	h	m	s	
1	0	6	41	I. Oc. D.
	3	12	40	I. Ec. R.
	21	17	7	I. Tr. I.
	22	12	7	I. Sh. I.
	23	26	0	I. Tr. E.
2	0	21	14	I. Sh. E.
	1	56	17	II. Tr. I.
	3	49	59	II. Sh. I.
	4	29	43	II. Tr. E.
	6	23	33	II. Sh. E.
	18	33	42	I.* Oc. D.
	21	41	37	I. Ec. R.
3	15	44	2	I.* Tr. I.
	16	40	55	I.* Sh. I.
	17	52	56	I.* Tr. E.
	18	49	59	I.* Sh. E.
	20	11	40	II. Oc. D.
4	0	40	0	II. Ec. R.
	6	31	24	III. Tr. I.
	8	11	8	III. Tr. E.
	10	26	58	III.* Sh. I.
	12	9	52	III.* Sh. E.
	13	0	41	I.* Oc. D.
	16	10	30	I.* Ec. R.
5	10	11	2	I. Tr. I.
	11	9	44	I.* Sh. I.
	12	19	58	I.* Tr. E.
	13	18	45	I.* Sh. E.
	15	7	32	II.* Tr. I.
	17	8	52	II.* Sh. I.
	17	41	13	II.* Tr. E.
	19	42	13	II.* Sh. E.
6	7	27	52	I. Oc. D.
	10	39	29	I.* Ec. R.
7	4	38	6	I. Tr. I.
	5	38	33	I. Sh. I.
	6	47	3	I. Tr. E.
	7	47	31	I. Sh. E.
	9	22	32	II. Oc. D.
	13	58	12	II.* Ec. R.
	20	13	11	III. Oc. D.
	21	57	55	III. Oc. R.
8	0	24	28	III. Ec. D.
	1	54	59	I. Oc. D.
	2	9	16	III. Ec. R.
	5	8	20	I. Ec. R.
	23	5	18	I. Tr. I.
9	0	7	24	I. Sh. I.
	1	14	16	I. Tr. E.
	2	16	21	I. Sh. E.
	4	20	12	II. Tr. I.
	6	28	29	II. Sh. I.
	6	54	9	II. Tr. E.
9	9	1	35	II. Sh. E.
	20	22	18	I. Oc. D.
	23	37	19	I. Ec. R.
10	17	32	31	I.* Tr. I.
	18	36	13	I.* Sh. I.
	19	41	31	I.* Tr. E.
	20	45	8	I. Sh. E.
	22	34	3	II. Oc. D.
11	3	16	24	II. Ec. R.
	10	3	3	III. Tr. I.
	11	47	39	III.* Tr. E.
	14	28	53	III.* Sh. I.
	14	49	37	I.* Oc. D.
	16	10	54	III.* Sh. E.
	18	6	12	I.* Ec. R.
12	11	59	50	I.* Tr. I.
	13	5	3	I.* Sh. I.
	14	8	52	I.* Tr. E.
	15	13	56	I.* Sh. E.
	17	32	42	II.* Tr. I.
	19	47	24	II. Sh. I.
	20	6	52	II. Tr. E.
	22	20	17	II. Sh. E.
13	9	17	7	I. Oc. D.
	12	35	11	I.* Ec. R.
14	6	27	14	I. Tr. I.
	7	33	53	I. Sh. I.
	8	36	17	I. Tr. E.
	9	42	44	I. Sh. E.
	11	46	11	II.* Oc. D.
	16	34	41	II.* Ec. R.
	23	48	22	III. Oc. D.
15	1	37	45	III. Oc. R.
	3	44	34	I. Oc. D.
	4	27	15	III. Ec. D.
	6	11	24	III. Ec. R.
	7	4	3	I. Ec. R.
16	0	54	45	I. Tr. I.
	2	2	47	I. Sh. I.
	3	3	50	I. Tr. E.
	4	11	35	I. Sh. E.
	6	46	33	II. Tr. I.
	9	6	58	II. Sh. I.
	9	20	56	II. Tr. E.
	11	39	37	II.* Sh. E.
	22	12	13	I. Oc. D.
17	1	33	1	I. Ec. R.
	19	22	16	I. Tr. I.
	20	31	37	I. Sh. I.
	21	31	24	I. Tr. E.
	22	40	22	I. Sh. E.
18	0	59	0	II. Oc. D.
18	5	52	59	II. Ec. R.
	13	39	46	III.* Tr. I.
	15	28	38	III.* Tr. E.
	16	39	51	I.* Oc. D.
	18	30	53	III.* Sh. I.
	20	1	55	I. Ec. R.
	20	12	5	III. Sh. E.
19	13	49	57	I.* Tr. I.
	15	0	29	I.* Sh. I.
	15	59	4	I.* Tr. E.
	17	9	13	I.* Sh. E.
	20	0	21	II. Tr. I.
	22	25	51	II. Sh. I.
	22	34	55	II. Tr. E.
20	0	58	18	II. Sh. E.
	11	7	40	I.* Oc. D.
	14	30	56	I.* Ec. R.
21	8	17	40	I. Tr. I.
	9	29	20	I. Sh. I.
	10	26	48	I.* Tr. E.
	11	38	2	I.* Sh. E.
	14	12	28	II.* Oc. D.
	19	11	24	II. Ec. R.
22	3	28	14	III. Oc. D.
	5	21	40	III. Oc. R.
	5	35	27	I. Oc. D.
	8	29	20	III. Ec. D.
	8	59	48	I. Ec. R.
	10	12	53	III. Ec. R.
23	2	45	31	I. Tr. I.
	3	58	14	I. Sh. I.
	4	54	40	I. Tr. E.
	6	6	55	I. Sh. E.
	9	15	26	II. Tr. I.
	11	45	18	II.* Sh. I.
	11	50	9	II.* Tr. E.
	14	17	32	II.* Sh. E.
24	0	3	25	I. Oc. D.
	3	28	47	I. Ec. R.
	21	13	23	I. Tr. I.
	22	27	5	I. Sh. I.
	23	22	33	I. Tr. E.
25	0	35	45	I. Sh. E.
	3	26	37	II. Oc. D.
	8	29	47	II. Ec. R.
	17	22	44	III.* Tr. I.
	18	31	22	I. Oc. D.
	19	15	13	III. Tr. E.
	21	57	40	I. Ec. R.
	22	33	34	III. Sh. I.
26	0	14	0	III. Sh. E.
	15	41	21	I.* Tr. I.
	16	55	59	I.* Sh. I.
26	17	50	34	I.* Tr. E.
	19	4	37	I. Sh. E.
	22	30	28	II. Tr. I.
27	1	4	12	II. Sh. I.
	1	5	22	II. Tr. E.
	3	36	13	II. Sh. E.
	12	59	31	I.* Oc. D.
	16	26	41	I.* Ec. R.
28	10	9	24	I. Tr. I.
	11	24	51	I.* Sh. I.
	12	18	37	I.* Tr. E.
	13	33	28	I.* Sh. E.
	16	41	26	II.* Oc. D.
	21	48	18	II. Ec. R.
29	7	13	28	III. Oc. D.
	7	27	34	I. Oc. D
	9	10	23	III. Oc. R.
	10	55	33	I.* Ec. R
	12	31	20	III.* Ec. D
	14	14	20	III.* Ec. R.
30	4	37	32	I. Tr. I
	5	53	46	I. Sh. I.
	6	46	48	I. Tr. E.
	8	2	23	I. Sh. E.
	11	46	35	II.* Tr. I.
	14	21	37	II.* Tr. E.
	14	23	35	II.* Sh. I
	16	55	24	II.* Sh. E.
31	1	55	53	I. Oc. D.
	5	24	32	I. Ec. R.
	23	5	43	I. Tr. I.

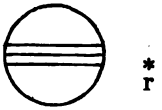
NOTE.—I. denotes ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., occultation; Tr., transit of the satellite; Sh., transit of the shadow. *Visible at Washington.

GREENWICH MEAN TIME.

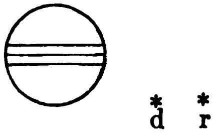
DECEMBER.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

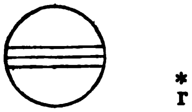
I.



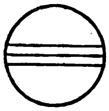
III.



II.



IV. No Eclipse.



Configurations at 14ʰ 10ᵐ for an Inverting Telescope.

Day.	West.		East.
1	•4	○	1•2• •3
2	•4 2• •1	○	3•
3	•2•4	○	1• 3•
4	3•	○	•4 •2 •1●
5	3• 1•2	○	• •4
6	•3 •2	○	•1 •4
7	1• •3	○	•2 •4
8		○	1• 2• •3 4•
9	2• •1	○	•3 4•
0	•2	○	1• 3• 4•
1	3• •	○	1 4• •2
2	○1• 3• 4•	○	2•
3	•34• 2•	○	•1
4	4• 1• •3	○	•2●
5	4•	○	•1•32•
6	•4 •12•	○	•3
7	•4 •2	○	1• 3•
8	○3• •4 •1	○	•2
9	○1• 3• •4	○	2•
0	•3 2•	○ •4	1●
1	•3 1• •	○	2 •4
2		○	•1 •3 2• •4
3	1• 2•	○	•3 •4
4	•2	○	1• 3• •4
5	•1	○	3• •2 4•
6	3•	○	1• 2• 4•
7	•3 2•	○	4• •1●
8	•3 1• •2	○	4•
9	4•	○	•1 •2 •3●
0	○2• 4• 1•	○	•3
1	4• •2	○	1• 3•

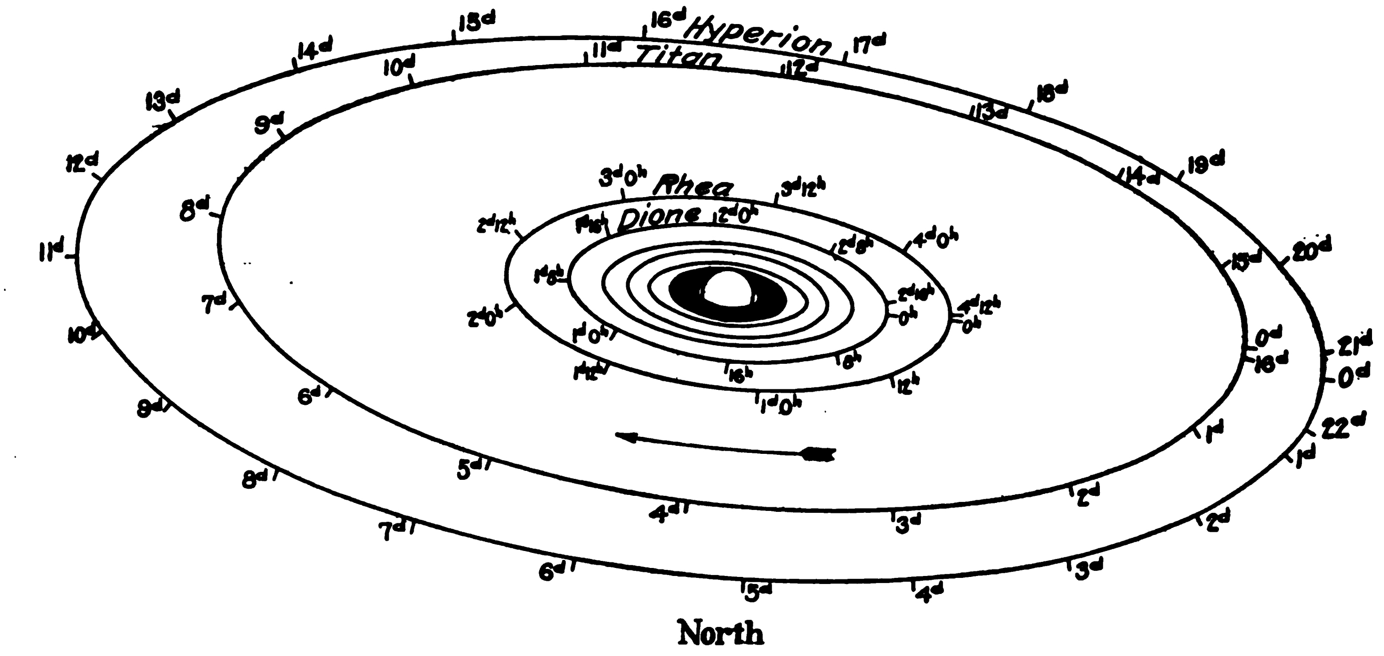
ELEMENTS FOR DETERMINING THE GEOCENTRIC POSITION, APPEARANCE, AND MAGNITUDE OF SATURN'S RINGS.

Greenwich Mean Noon.		a	b	p	l	l′	u	u′	Stellar Mag.
		Outer Major Axis.	Outer Minor Axis.	Inclination of Northern Semi-minor Axis to Circle of Declination from North to East.	The Elevation of the Earth above the Plane of the Rings.	The Elevation of the Sun above the Plane of the Rings.	Earth's Longitude from Saturn counted on Plane of Rings from the Rings' Ascending Node on—		
							Equator.	Ecliptic.	
		″	″	° ′	° ′	° ′	° ′	° ′	
Jan.	1	46.67	−19.57	−6 58.3	−24 47.6	−24 55.7	160 7.2	117 42.1	−0.2
	11	46.63	19.70	6 56.2	24 59.3	24 51.8	159 14.2	116 49.2	0.2
	21	46.42	19.75	6 54.0	25 10.4	24 47.8	158 23.0	115 58.1	0.1
	31	46.03	19.70	6 52.0	25 20.4	24 43.7	157 36.9	115 12.0	−0.1
Feb.	10	45.50	19.57	6 50.3	25 28.7	24 39.5	156 58.2	114 33.4	0.0
	20	44.86	−19.37	−6 49.1	−25 35.4	−24 35.3	156 29.4	114 4.6	0.0
Mar.	1	44.13	19.11	6 48.2	25 40.0	24 31.0	156 11.4	113 46.6	+0.1
	11	43.36	18.81	6 48.0	25 42.4	24 26.7	156 5.5	113 40.8	0.2
	21	42.57	18.47	6 48.4	25 42.6	24 22.3	156 11.8	113 47.1	0.2
	31	41.79	18.11	6 49.3	25 40.7	24 17.9	156 30.0	114 5.4	0.3
Apr.	10	41.03	−17.74	−6 50.7	−25 36.8	−24 13.4	156 59.5	114 35.0	+0.3
	20	40.32	17.37	6 52.6	25 30.7	24 8.8	157 39.6	115 15.1	0.3
	30	39.66	17.00	6 54.8	25 22.5	24 4.2	158 29.4	116 4.9	0.3
May	10	39.08	16.65	6 57.3	25 12.4	23 59.5	159 27.1	117 2.7	0.4
	20	38.58	16.31	7 0.0	25 0.4	23 54.8	160 32.1	118 7.7	0.4
	30	38.16	−15.99	−7 2.8	−24 46.5	−23 50.0	161 42.8	119 18.5	+0.4
June	9	37.83	15.70	7 5.3	24 30.9	23 45.1	162 58.2	120 33.9	0.4
	19	37.58	15.42	7 7.8	24 13.9	23 40.2	164 16.9	121 52.7	0.3
	29	37.41	15.16	7 10.0	23 55.4	23 35.2	165 37.6	123 13.4	0.3
July	9	37.33	14.94	7 12.0	23 35.9	23 30.2	166 59.7	124 35.6	0.3
	19	37.34	−14.74	−7 13.8	−23 15.6	−23 25.1	168 21.5	125 57.4	+0.3
	29	37.44	14.57	7 15.3	22 54.6	23 19.9	169 42.3	127 18.2	0.4
Aug.	8	37.63	14.44	7 16.4	22 33.6	23 14.7	171 0.8	128 36.8	0.4
	18	37.91	14.33	7 17.2	22 12.9	23 9.4	172 15.7	129 51.8	0.4
	28	38.27	14.26	7 17.7	21 52.7	23 4.1	173 26.7	131 2.8	0.4
Sept.	7	38.72	−14.23	−7 18.0	−21 33.6	−22 58.7	174 32.2	132 8.3	+0.5
	17	39.24	14.24	7 18.1	21 16.2	22 53.2	175 31.0	133 7.2	0.5
	27	39.84	14.29	7 18.2	21 0.6	22 47.6	176 22.5	133 58.7	0.5
Oct.	7	40.50	14.38	7 18.1	20 47.6	22 42.0	177 5.5	134 41.8	0.4
	17	41.23	14.53	7 18.0	20 37.5	22 36.4	177 38.9	135 15.2	0.4
	27	41.99	−14.72	−7 17.9	−20 31.0	−22 30.7	178 2.2	135 38.6	+0.4
Nov.	6	42.78	14.96	7 17.9	20 28.0	22 25.0	178 14.4	135 50.8	0.3
	16	43.56	15.24	7 17.9	20 28.8	22 19.2	178 15.4	135 51.9	0.3
	26	44.30	15.56	7 18.0	20 33.3	22 13.4	178 5.0	135 41.5	0.2
Dec.	6	44.98	15.90	7 18.2	20 41.6	22 7.5	177 44.1	135 20.6	0.1
	16	45.56	−16.24	−7 18.4	−20 52.9	−22 1.6	177 13.3	134 49.9	+0.1
	26	46.03	16.58	7 18.5	21 6.9	21 55.6	176 34.1	134 10.7	0.0
	31	46.20	−16.74	−7 18.5	−21 14.8	−21 52.5	176 12.0	133 48.6	0.0

The factor to be multiplied by *a* and *b* to obtain the axes of—

The inner ellipse of the outer ring=0.8801 log factor=9.9445
The outer ellipse of the inner ring=0.8599, log factor=9.9344
The inner ellipse of the inner ring=0.6650, log factor=9.8228
The inner ellipse of the dusky ring=0.5486, log factor=9.7392

NOTE.—The negative sign of *l* indicates that the visible surface of the rings is the southern one.



NAMES OF THE SATELLITES.	
I.	Mimas.
II.	Enceladus.
III.	Tethys.
IV.	Dione.
V.	Rhea.
VI.	Titan.
VII.	Hyperion.
VIII.	Iapetus.
IX.	Phœbe.

APPARENT ORBITS OF THE SEVEN INNER SATELLITES OF SATURN,

AT DATE OF OPPOSITION, JANUARY 4, 1916,

AS SEEN IN AN INVERTING TELESCOPE.

MEAN SYNODIC PERIODS.	d	h
I.	0	22.6
II.	1	8.9
III.	1	21.3
IV.	2	17.7
V.	4	12.5
VI.	15	23.3
VII.	21	7.6
VIII.	79	22.1
IX.	523	15.6

GREENWICH MEAN TIME OF GREATEST ELONGATION, ETC.

In the diagram on the preceding page, the points of the orbits marked "0" are those of the eastern elongation, as seen in an inverting telescope. The times of these elongations may be found from the following tables, and the apparent position of a satellite at any other time may be marked on the diagram by setting off on the proper orbit the elapsed interval in days and hours since the last eastern elongation. The orbits of the five inner satellites are regarded as circular and the time of any elongation not given in the tables may be readily found from those given by adding or subtracting the proper multiple of the mean synodic period. For Titan, Hyperion and Iapetus the eccentricity is taken into account, and for Iapetus the times both of the elongations and of the conjunctions are given. The following abbreviations are used in the tables:

E., East Elongation.	I., Inferior Conjunction (north of planet).
W., West Elongation.	S., Superior Conjunction (south of planet).

MIMAS.

Greatest Elongations Visible in the United States.

	d h		d h		d h		d h		d h		d h
Jan.	1 14.9 W.	Jan.	28 0.0 W.	Feb.	28 13.7 E.	Apr.	14 18.3 E.	Oct.	25 0.1 E.	Dec.	1 16.8 E.
	2 13.5 W.		28 11.3 E.		29 12.3 E.		15 16.9 E.		25 22.7 E.		2 15.4 E.
	3 0.8 E.		28 22.6 W.	Mar.	2 20.8 W.		16 15.5 E.		26 21.3 E.		3 14.0 E.
	3 12.1 W.		29 21.2 W.		3 19.5 W.		17 14.2 E.		27 19.9 E.		4 1.3 W.
	3 23.4 E.		30 19.9 W.		4 18.1 W.		18 12.8 E.		28 18.6 E.		4 23.9 W.
	4 10.7 W.		31 18.5 W.		5 16.7 W.		22 18.5 W.		29 17.2 E.		5 22.5 W.
	4 22.0 E.	Feb.	1 17.1 W.		6 15.3 W.		23 17.1 W.	Nov.	2 0.3 W.		6 21.1 W.
	5 20.6 E.		2 15.7 W.		7 13.9 W.		24 15.7 W.		2 22.9 W.		7 19.8 W.
	6 19.3 E.		3 14.3 W.		8 12.5 W.		25 14.3 W.		3 21.5 W.		8 18.4 W.
	7 17.9 E.		4 12.9 W.		10 21.1 E.		26 13.0 W.		4 20.2 W.		9 17.0 W.
	8 16.5 E.		5 11.5 W.		11 19.7 E.	May	1 17.4 E.		5 18.8 W.		10 15.6 W.
	9 15.1 E.		5 22.9 E.		12 18.3 E.		2 16.0 E.		6 17.4 W.		11 14.2 W.
	10 13.7 E.		6 21.5 E.		13 16.9 E.		3 14.6 E.		7 16.0 W.		12 1.5 E.
	11 1.0 W.		7 20.1 E.		14 15.6 E.		. . . .		10 0.6 E.		13 0.1 E.
	11 12.3 E.		8 18.7 E.		15 14.2 E.		. . . .		10 23.2 E.		13 22.7 E.
	11 23.6 W.		9 17.3 E.		16 12.8 E.	Sept.	22 23.0 E.		11 21.8 E.		14 21.3 E.
	12 10.9 E.		10 15.9 E.		19 20.0 W.		23 21.6 E.		12 20.4 E.		15 20.0 E.
	12 22.2 W.		11 14.5 E.		20 18.6 W.		24 20.2 E.		13 19.0 E.		16 18.6 E.
	13 20.8 W.		12 13.1 E.		21 17.2 W.		25 18.9 E.		14 17.6 E.		17 17.2 E.
	14 19.5 W.		13 11.7 E.		22 15.8 W.		30 23.3 W.		15 16.3 E.		18 15.8 E.
	15 18.1 W.		13 23.0 W.		23 14.4 W.	Oct.	1 21.9 W.		16 14.9 E.		19 14.4 E.
	16 16.7 W.		14 21.6 W.		24 13.1 W.		2 20.6 W.		18 0.8 W.		20 13.0 E.
	17 15.3 W.		15 20.2 W.		27 20.3 E.		3 19.2 W.		18 23.4 W.		21 0.3 W.
	18 13.9 W.		16 18.9 W.		28 18.9 E.		4 17.8 W.		19 22.0 W.		21 22.9 W.
	19 12.5 W.		17 17.5 W.		29 17.5 E.		8 23.6 E.		20 20.7 W.		22 21.5 W.
	19 23.8 E.		18 16.1 W.		30 16.2 E.		9 22.2 E.		21 19.3 W.		23 20.2 W.
	20 11.1 W.		19 14.8 W.		31 14.8 E.		10 20.9 E.		22 17.9 W.		24 18.8 W.
	20 22.4 E.		20 13.4 W.	Apr.	1 13.4 E.		11 19.5 E.		23 16.5 W.		25 17.4 W.
	21 21.0 E.		21 12.0 W.		2 12.1 E.		12 18.1 E.		24 15.1 W.		26 16.0 W.
	22 19.7 E.		22 22.0 E.		5 19.3 W.		16 23.9 W.		26 1.1 E.		27 14.6 W.
	23 18.3 E.		23 20.6 E.		6 17.9 W.		17 22.5 W.		26 23.7 E.		28 13.2 W.
	24 16.9 E.		24 19.2 E.		7 16.5 W.		18 21.1 W.		27 22.3 E.		29 0.5 E.
	25 15.5 E.		25 17.8 E.		8 15.2 W.		19 19.7 W.		28 20.9 E.		29 23.1 E.
	26 14.1 E.		26 16.4 E.		9 13.9 W.		20 18.4 W.		29 19.5 E.		30 21.7 E.
	27 12.7 E.		27 15.1 E.		10 12.5 W.		21 17.0 W.		30 18.1 E.		31 20.4 E.

GREENWICH MEAN TIME OF GREATEST ELONGATION.

ENCELADUS.

	d h		d h		d h		d h		d h		d h
Jan.	1 1.4 E.	Feb.	9 18.7 E.	Mar.	20 12.4 E.	Apr.	29 6.4 E.	Oct.	18 23.7 E.	Nov.	27 17.4 E.
	2 10.2 E.		11 3.6 E.		21 21.3 E.		30 15.3 E.		20 8.6 E.		29 2.3 E.
	3 19.1 E.		12 12.5 E.		23 6.2 E.	May	2 0.2 E.		21 17.4 E.		30 11.2 E.
	5 4.0 E.		13 21.4 E.		24 15.1 E.		3 9.1 E.		23 2.3 E.	Dec.	1 20.1 E.
	6 12.8 E.		15 6.3 E.		26 0.0 E.		. . . .		24 11.2 E.		3 5.0 E.
	7 21.7 E.		16 15.1 E.		27 8.9 E.		. . . .		25 20.1 E.		4 13.9 E.
	9 6.6 E.		18 0.0 E.		28 17.8 E.	Sept.	17 11.1 E.		27 5.0 E.		5 22.7 E.
	10 15.5 E.		19 8.9 E.		30 2.7 E.		18 20.0 E.		28 13.9 E.		7 7.6 E.
	12 0.3 E.		20 17.8 E.		31 11.5 E.		20 4.9 E.		29 22.7 E.		8 16.4 E.
	13 9.2 E.		22 2.7 E.	Apr.	1 20.4 E.		21 13.8 E.		31 7.6 E.		10 1.3 E.
	14 18.1 E.		23 11.6 E.		3 5.3 E.		22 22.7 E.	Nov.	1 16.5 E.		11 10.2 E.
	16 3.0 E.		24 20.4 E.		4 14.2 E.		24 7.6 E.		3 1.4 E.		12 19.1 E.
	17 11.8 E.		26 5.3 E.		5 23.1 E.		25 16.5 E.		4 10.3 E.		14 4.0 E.
	18 20.7 E.		27 14.2 E.		7 8.0 E.		27 1.4 E.		5 19.1 E.		15 12.8 E.
	20 5.6 E.		28 23.1 E.		8 16.9 E.		28 10.3 E.		7 4.0 E.		16 21.7 E.
	21 14.4 E.	Mar.	1 8.0 E.		10 1.8 E.		29 19.2 E.		8 12.9 E.		18 6.5 E.
	22 23.3 E.		2 16.9 E.		11 10.7 E.	Oct.	1 4.1 E.		9 21.8 E.		19 15.3 E.
	24 8.2 E.		4 1.7 E.		12 19.6 E.		2 13.0 E.		11 6.7 E.		21 0.2 E.
	25 17.1 E.		5 10.6 E.		14 4.5 E.		3 21.9 E.		12 15.6 E.		22 9.0 E.
	27 1.9 E.		6 19.5 E.		15 13.4 E.		5 6.8 E.		14 0.4 E.		23 17.9 E.
	28 10.8 E.		8 4.4 E.		16 22.3 E.		6 15.7 E.		15 9.3 E.		25 2.8 E.
	29 19.7 E.		9 13.3 E.		18 7.2 E.		8 0.7 E.		16 18.2 E.		26 11.7 E.
	31 4.6 E.		10 22.2 E.		19 16.1 E.		9 9.5 E.		18 3.1 E.		27 20.5 E.
Feb.	1 13.4 E.		12 7.1 E.		21 1.0 E.		10 18.4 E.		19 12.0 E.		29 5.4 E.
	2 22.3 E.		13 16.0 E.		22 9.9 E.		12 3.3 E.		20 20.9 E.		30 14.3 E.
	4 7.2 E.		15 0.8 E.		23 18.8 E.		13 12.2 E.		22 5.8 E.		31 23.2 E.
	5 16.1 E.		16 9.7 E.		25 3.7 E.		14 21.1 E.		23 14.7 E.		
	7 1.0 E.		17 18.6 E.		26 12.6 E.		16 5.9 E.		24 23.6 E.		
	8 9.8 E.		19 3.5 E.		27 21.5 E.		17 14.8 E.		26 8.5 E.		

TETHYS.

	d h		d h		d h		d h		d h		d h
Jan.	2 17.8 E.	Feb.	11 9.0 E.	Mar.	22 0.4 E.	Apr.	30 16.2 E.	Oct.	19 13.5 E.	Nov.	28 5.0 E.
	4 15.1 E.		13 6.3 E.		23 21.7 E.	May	2 13.5 E.		21 10.8 E.		30 2.3 E.
	6 12.4 E.		15 3.6 E.		25 19.0 E.		. . . .		23 8.1 E.	Dec.	1 23.6 E.
	8 9.7 E.		17 0.9 E.		27 16.4 E.		. . . .		25 5.5 E.		3 20.9 E.
	10 7.0 E.		18 22.2 E.		29 13.7 E.	Sept.	17 11.1 E.		27 2.8 E.		5 18.2 E.
	12 4.2 E.		20 19.5 E.		31 11.0 E.		19 8.4 E.		29 0.1 E.		7 15.5 E.
	14 1.5 E.		22 16.8 E.	Apr.	2 8.3 E.		21 5.7 E.		30 21.4 E.		9 12.8 E.
	15 22.8 E.		24 14.1 E.		4 5.7 E.		23 3.1 E.	Nov.	1 18.7 E.		11 10.1 E.
	17 20.1 E.		26 11.4 E.		6 3.0 E.		25 0.4 E.		3 16.0 E.		13 7.3 E.
	19 17.4 E.		28 8.7 E.		8 0.3 E.		26 21.7 E.		5 13.3 E.		15 4.6 E.
	21 14.7 E.	Mar.	1 6.0 E.		9 21.6 E.		28 19.1 E.		7 10.6 E.		17 1.9 E.
	23 12.0 E.		3 3.3 E.		11 19.0 E.		30 16.4 E.		9 8.0 E.		18 23.2 E.
	25 9.3 E.		5 0.6 E.		13 16.3 E.	Oct.	2 13.7 E.		11 5.3 E.		20 20.5 E.
	27 6.5 E.		6 21.9 E.		15 13.6 E.		4 11.0 E.		13 2.6 E.		22 17.8 E.
	29 3.8 E.		8 19.2 E.		17 10.9 E.		6 8.3 E.		14 23.9 E.		24 15.1 E.
	31 1.1 E.		10 16.5 E.		19 8.3 E.		8 5.6 E.		16 21.2 E.		26 12.4 E.
Feb.	1 22.4 E.		12 13.8 E.		21 5.6 E.		10 3.0 E.		18 18.5 E.		28 9.6 E.
	3 19.7 E.		14 11.2 E.		23 2.9 E.		12 0.3 E.		20 15.8 E.		30 6.9 E.
	5 17.0 E.		16 8.5 E.		25 0.2 E.		13 21.6 E.		22 13.1 E.		
	7 14.3 E.		18 5.8 E.		26 21.5 E.		15 18.9 E.		24 10.4 E.		
	9 11.6 E.		20 3.1 E.		28 18.9 E.		17 16.2 E.		26 7.7 E.		

GREENWICH MEAN TIME OF GREATEST ELONGATION.

DIONE.

	d h		d h		d h		d h		d h		d h
Jan.	3 3.3 E.	Feb.	10 10.2 E.	Mar.	19 17.7 E.	Apr.	27 1.7 E.	Oct.	16 15.5 E.	Nov.	23 23.1 E.
	5 20.9 E.		13 3.9 E.		22 11.4 E.		29 19.5 E.		19 9.2 E.		26 16.8 E.
	8 14.5 E.		15 21.5 E.		25 5.1 E.	May	2 13.2 E.		22 2.9 E.		29 10.5 E.
	11 8.1 E.		18 15.2 E.		27 22.8 E.		. . . .		24 20.6 E.	Dec.	2 4.1 E.
	14 1.8 E.		21 8.9 E.		30 16.5 E.		. . . .		27 14.3 E.		4 21.8 E.
	16 19.4 E.		24 2.6 E.	Apr.	2 10.3 E.	Sept.	22 0.0 E.		30 8.1 E.		7 15.4 E.
	19 13.0 E.		26 20.2 E.		5 4.0 E.		24 17.8 E.	Nov.	2 1.7 E.		10 9.1 E.
	22 6.6 E.		29 13.9 E.		7 21.7 E.		27 11.5 E.		4 19.4 E.		13 2.7 E.
	25 0.3 E.	Mar.	3 7.6 E.		10 15.4 E.		30 5.2 E.		7 13.1 E.		15 20.4 E.
	27 17.9 E.		6 1.3 E.		13 9.1 E.	Oct.	2 22.9 E.		10 6.7 E.		18 14.0 E.
	30 11.6 E.		8 19.0 E.		16 2.8 E.		5 16.6 E.		13 0.4 E.		21 7.7 E.
Feb.	2 5.2 E.		11 12.7 E.		18 20.6 E.		8 10.3 E.		15 18.1 E.		24 1.3 E.
	4 22.9 E.		14 6.3 E.		21 14.3 E.		11 4.1 E.		18 11.8 E.		26 19.0 E.
	7 16.6 E.		17 0.0 E.		24 8.0 E.		13 21.8 E.		21 5.5 E.		29 12.6 E.

RHEA.

	d h		d h		d h		d h		d h		d h
Jan.	3 21.1 E.	Feb.	13 11.9 E.	Mar.	25 3.5 E.		. . . .	Oct.	19 5.4 E.	Nov.	28 21.2 E.
	8 9.4 E.		18 0.3 E.		29 16.1 E.		. . . .		23 17.8 E.	Dec.	3 9.6 E.
	12 21.7 E.		22 12.7 E.	Apr.	3 4.6 E.	Sept.	17 13.8 E.		28 6.2 E.		7 21.9 E.
	17 10.0 E.		27 1.1 E.		7 17.1 E.		22 2.4 E.	Nov.	1 18.6 E.		12 10.3 E.
	21 22.3 E.	Mar.	2 13.5 E.		12 5.6 E.		26 14.9 E.		6 7.1 E.		16 22.6 E.
	26 10.6 E.		7 1.9 E.		16 18.1 E.	Oct.	1 3.5 E.		10 19.5 E.		21 11.0 E.
	30 22.9 E.		11 14.3 E.		21 6.6 E.		5 16.0 E.		15 8.0 E.		25 23.3 E.
Feb.	4 11.2 E.		16 2.7 E.		25 19.1 E.		10 4.4 E.		19 20.5 E.		30 11.6 E.
	8 23.6 E.		20 15.1 E.		30 7.7 E.		14 16.9 E.		24 8.9 E.		

TITAN.

	d h		d h		d h		d h		d h		d h
Jan.	5 18.9 E.	Feb.	22 11.7 E.	Apr.	10 8.5 E.	Sept.	17 15.0 E.	Nov.	4 13.8 E.	Dec.	22 8.3 E.
	13 10.6 W.	Mar.	1 3.8 W.		18 1.4 W.		25 8.3 W.		12 6.4 W.		30 0.3 W.
	21 16.2 E.		9 10.0 E.		26 8.4 E.	Oct.	3 15.0 E.		20 12.5 E.		
	29 8.0 W.		17 2.5 W.	May	4 1.5 W.		11 8.1 W.		28 4.8 W.		
Feb.	6 13.7 E.		25 8.9 E.		. . . .		19 14.7 E.	Dec.	6 10.6 E.		
	14 5.7 W.	Apr.	2 1.7 W.		. . . .		27 7.5 W.		14 2.8 W.		

HYPERION.

	d h		d h		d h		d h		d h		d h
Jan.	8 10.0 E.	Feb.	19 23.9 E.	Apr.	2 18.7 E.	Sept.	21 12.3 E.	Nov.	3 2.6 E.	Dec.	15 10.3 E.
	20 1.0 W.	Mar	2 16.3 W.		14 13.3 W.	Oct.	3 6.3 W.		14 18.0 W.		26 23.8 W.
	29 16.5 E.		12 8.6 E.		24 5.6 E.		12 20.4 E.		24 7.3 E.		
Feb.	10 8.0 W.		24 1.9 W.		. . . .		24 13.1 W.	Dec.	5 21.6 W.		

IAPETUS.

	d h		d h		d h		d h		d h		d h
Jan.	15 10.0 W.	Feb.	23 22.5 E.	Apr.	3 8.2 W.		. . . .	Oct.	23 14.1 E.	Dec.	1 11.3 W.
Feb.	3 10.3 S.	Mar.	15 6.3 I.		22 21.0 S.	Oct.	2 11.9 S.	Nov.	12 16.8 I.		20 20.6 S.

DIFFERENTIAL COORDINATES OF PHOEBE.

Greenwich Mean Noon.	$\alpha_{Ph.}-\alpha_{Sat.}$	$\delta_{Ph.}-\delta_{Sat.}$	Greenwich Mean Noon.	$\alpha_{Ph.}-\alpha_{Sat.}$	$\delta_{Ph.}-\delta_{Sat.}$	Greenwich Mean Noon.	$\alpha_{Ph.}-\alpha_{Sat.}$	$\delta_{Ph.}-\delta_{Sat.}$
	m s	′ ″		m s	′ ″		m s	′ ″
Jan. 1	+0 46.2	+2 53	Apr. 14	−1 27.2	+2 31	Sept. 20	−0 41.1	−0 37
3	0 43.7	2 56	16	1 29.3	2 30	22	0 37.5	0 47
5	0 41.2	2 58	18	1 31.3	2 29	24	0 33.9	0 56
7	0 38.7	3 1	20	1 33.4	2 29	26	0 30.3	1 6
9	0 36.1	3 3	22	1 35.3	2 28	28	0 26.6	1 15
11	+0 33.6	+3 5	24	−1 37.3	+2 28	30	−0 22.9	−1 25
13	0 31.0	3 7	26	1 39.1	2 27	Oct. 2	0 19.1	1 35
15	0 28.4	3 8	28	1 41.0	2 27	4	0 15.4	1 45
17	0 25.8	3 10	30	1 42.8	2 27	6	0 11.6	1 55
19	0 23.2	3 11	May 2	1 44.5	2 27	8	0 7.7	2 5
21	+0 20.5	+3 12	4	−1 46.1	+2 26	10	−0 3.9	−2 15
23	0 17.9	3 13	6	1 47.7	2 26	12	0 0.0	2 25
25	0 15.2	3 14	8	1 49.3	2 26	14	+0 3.8	2 36
27	0 12.6	3 14	10	1 50.8	2 26	16	0 7.7	2 46
29	0 9.9	3 14	12	1 52.2	2 26	18	0 11.6	2 56
31	+0 7.2	+3 15	14	−1 53.6	+2 26	20	+0 15.5	−3 6
Feb. 2	0 4.5	3 14	16	1 54.9	2 26	22	0 19.4	3 15
4	+0 1.8	3 14	18	1 56.2	2 27	24	0 23.2	3 25
6	−0 0.9	3 14	20	1 57.4	2 27	26	0 27.1	3 35
8	0 3.6	3 14	22	1 58.5	2 27	28	0 30.9	3 45
10	−0 6.3	+3 13	24	−1 59.6	+2 28	30	+0 34.8	−3 54
12	0 9.0	3 13	26	2 0.6	2 28	Nov. 1	0 38.6	4 3
14	0 11.7	3 12	28	2 1.5	2 29	3	0 42.4	4 12
16	0 14.4	3 11	30	2 2.4	2 29	5	0 46.2	4 21
18	0 17.1	3 10	June 1	2 3.2	2 30	7	0 50.0	4 30
20	−0 19.8	+3 9	3	−2 3.9	+2 30	9	+0 53.7	−4 38
22	0 22.5	3 7	5	2 4.5	2 31	11	0 57.4	4 46
24	0 25.2	3 6	7	2 5.1	2 31	13	1 1.0	4 54
26	0 27.9	3 5	9	2 5.6	2 32	15	1 4.6	5 2
28	0 30.6	3 3	11	−2 6.0	+2 32	17	1 8.2	5 9
Mar. 1	−0 33.2	+3 2		....	...	19	+1 11.7	−5 16
3	0 35.9	3 0		....	...	21	1 15.1	5 22
5	0 38.6	2 58	Aug. 11	−1 39.5	+1 44	23	1 18.5	5 29
7	0 41.2	2 57	13	1 37.2	1 39	25	1 21.9	5 35
9	0 43.8	2 55	15	1 34.9	1 35	27	1 25.2	5 40
11	−0 46.4	+2 54	17	−1 32.6	+1 29	29	+1 28.4	−5 45
13	0 49.0	2 52	19	1 30.1	1 24	Dec. 1	1 31.5	5 50
15	0 51.6	2 50	21	1 27.6	1 18	3	1 34.6	5 55
17	0 54.2	2 49	23	1 25.0	1 12	5	1 37.6	5 59
19	0 56.7	2 47	25	1 22.3	1 6	7	1 40.6	6 2
21	−0 59.2	+2 46	27	−1 19.5	+1 0	9	+1 43.5	−6 5
23	1 1.7	2 44	29	1 16.7	0 53	11	1 46.3	6 8
25	1 4.2	2 43	31	1 13.8	0 46	13	1 49.0	6 11
27	1 6.6	2 42	Sept. 2	1 10.8	0 39	15	1 51.6	6 13
29	1 9.0	2 40	4	1 7.7	0 31	17	1 54.2	6 14
31	−1 11.4	+2 39	6	−1 4.6	+0 23	19	+1 56.7	−6 16
Apr. 2	1 13.8	2 37	8	1 1.4	0 15	21	1 59.1	6 17
4	1 16.1	2 36	10	0 58.1	+0 7	23	2 1.4	6 17
6	1 18.4	2 35	12	0 54.8	−0 2	25	2 3.6	6 17
8	1 20.6	2 34	14	0 51.5	0 10	27	2 5.7	6 17
10	−1 22.8	+2 33	16	−0 48.1	−0 19	29	+2 7.8	−6 16
12	−1 25.0	+2 32	18	−0 44.6	−0 28	31	+2 9.7	−6 15

Time from Eastern Elongation.	Mimas.		Time from Eastern Elongation.		Enceladus.		Tethys.		Time from Eastern Elongation.		Dione.	
	p^1	F			p^1	F	p^1	F			p^1	F
h	°		d	h	°		°		d	h	°	
0.0	83.3	1.000	0	0	83.3	1.000	83.3	1.000	0	0	83.3	1.000
0.5	80.2	0.992	0	1	78.7	0.985	80.1	0.992	0	2	78.7	0.985
1.0	76.9	0.968	0	2	73.7	0.941	76.7	0.968	0	4	73.7	0.941
1.5	73.4	0.928	0	3	68.2	0.871	73.1	0.929	0	6	68.1	0.871
2.0	69.6	0.875	0	4	61.4	0.778	69.2	0.877	0	8	61.3	0.778
2.5	65.1	0.809	0	5	52.6	0.672	64.6	0.812	0	10	52.5	0.671
3.0	59.8	0.733	0	6	40.4	0.562	59.2	0.738	0	12	40.2	0.562
3.5	53.2	0.651	0	7	22.8	0.470	52.5	0.657	0	14	22.6	0.470
4.0	44.7	0.568	0	8	359.1	0.422	44.0	0.576	0	16	358.8	0.423
4.5	33.4	0.490	0	9	333.7	0.442	32.7	0.500	0	18	333.5	0.443
5.0	18.3	0.429	0	10	313.3	0.518	17.8	0.441	0	20	313.1	0.520
5.5	359.5	0.397	0	11	299.0	0.623	359.7	0.410	0	22	298.9	0.624
6.0	339.6	0.405	0	12	288.9	0.723	340.4	0.417	1	0	288.8	0.734
6.5	322.2	0.449	0	13	281.3	0.832	323.3	0.459	1	2	281.2	0.834
7.0	308.6	0.517	0	14	275.3	0.913	309.7	0.525	1	4	275.2	0.914
7.5	298.4	0.599	0	15	270.1	0.969	299.5	0.604	1	6	270.0	0.970
8.0	290.7	0.683	0	16	265.4	0.997	291.7	0.686	1	8	265.3	0.997
8.5	284.7	0.763	0	17	260.8	0.995	285.5	0.764	1	10	260.7	0.995
9.0	279.8	0.835	0	18	256.0	0.964	280.4	0.836	1	12	255.9	0.963
9.5	275.6	0.897	0	19	250.7	0.905	276.1	0.896	1	14	250.6	0.903
10.0	271.9	0.945	0	20	244.6	0.822	272.3	0.945	1	16	244.4	0.819
10.5	268.5	0.979	0	21	236.8	0.720	268.8	0.978	1	18	236.5	0.717
11.0	265.3	0.997	0	22	226.3	0.610	265.5	0.997	1	20	225.9	0.607
11.5	262.1	0.999	0	23	211.4	0.507	262.2	0.999	1	22	210.8	0.505
12.0	258.9	0.984	1	0	190.2	0.436	258.9	0.986	2	0	189.4	0.435
12.5	255.6	0.955	1	1	164.6	0.425	255.5	0.957	2	2	163.9	0.426
13.0	252.0	0.910	1	2	141.6	0.480	251.8	0.913	2	4	140.9	0.482
13.5	247.9	0.851	1	3	124.7	0.575	247.7	0.856	2	6	124.2	0.579
14.0	243.2	0.781	1	4	112.9	0.684	242.8	0.787	2	8	112.6	0.688
14.5	237.5	0.701	1	5	104.4	0.790	237.1	0.710	2	10	104.2	0.794
15.0	230.3	0.619	1	6	97.8	0.880	229.8	0.628	2	12	97.6	0.883
15.5	220.8	0.536	1	7	92.3	0.948	220.4	0.549	2	14	92.1	0.950
16.0	208.1	0.464	1	8	87.5	0.988	207.9	0.477	2	16	87.3	0.969
16.5	191.5	0.413	1	9	82.8	1.000	191.9	0.426	2	18	82.6	1.000
17.0	171.9	0.396	1	10			172.9	0.410				
17.5	152.5	0.418	1	11			154.1	0.428				
18.0	136.5	0.474	1	12			138.2	0.480				
18.5	124.4	0.549	1	13			125.9	0.552				
19.0	115.2	0.631	1	14			116.5	0.632				
19.5	108.3	0.714	1	15			109.4	0.713				
20.0	102.7	0.792	1	16			103.6	0.790				
20.5	98.1	0.860	1	17			98.9	0.858				
21.0	94.1	0.917	1	18			94.7	0.915				
21.5	90.6	0.960	1	19			91.0	0.958				
22.0	87.3	0.988	1	20			87.6	0.986				
22.5	84.1	1.000	1	21			84.3	0.999				
23.0	80.9	0.995	1	22			81.1	0.996				

Position angle of satellite $p = p^1 + (P - P_0)$.

Apparent distance of satellite $s = F\frac{a(\rho)}{\rho}$.

Time from Eastern Elongation.	Rhea.		Time from Eastern Elongation.	Titan.		Hyperion.		Time from Eastern Elongation.	Iapetus.	
	p^1	F		p^1	F	p^1	F		p^1	F
d h	°		d h	°		°		d	°	
0 0	83.3	1.000	0 0	83.3	1.001	83.9	0.950	0	81.2	1.027
0 3	79.1	0.988	0 10	79.4	0.985	80.6	0.953	2	79.5	1.015
0 6	74.6	0.951	0 20	75.2	0.948	77.3	0.942	4	77.8	0.979
0 9	69.7	0.892	1 6	70.6	0.889	73.9	0.919	6	76.0	0.922
0 12	63.9	0.815	1 16	65.2	0.813	70.3	0.885	8	73.8	0.843
0 15	56.7	0.722	2 2	58.6	0.722	66.4	0.842	10	71.2	0.747
0 18	47.4	0.622	2 12	49.9	0.623	61.9	0.789	12	67.6	0.634
0 21	34.4	0.527	2 22	38.0	0.526	56.8	0.731	14	62.5	0.511
1 0	16.6	0.453	3 8	21.1	0.447	50.8	0.669	16	53.8	0.381
1 3	354.2	0.423	3 18	359.1	0.405	43.5	0.608	18	36.6	0.259
1 6	331.5	0.449	4 4	335.6	0.420	34.7	0.550	20	359.1	0.186
1 9	313.3	0.521	4 14	316.0	0.484	23.9	0.501	22	314.8	0.225
1 12	300.1	0.615	5 0	302.0	0.575	11.3	0.466	24	292.2	0.338
1 15	290.5	0.715	5 10	291.9	0.674	357.1	0.452	26	281.5	0.467
1 18	283.2	0.808	5 20	284.4	0.770	342.9	0.461	28	275.4	0.593
1 21	277.4	0.887	6 6	278.4	0.853	329.7	0.490	30	271.4	0.707
2 0	272.4	0.948	6 16	273.5	0.920	318.5	0.537	32	268.4	0.805
2 3	267.9	0.986	7 2	269.1	0.967	309.2	0.594	34	266.1	0.882
2 6	263.6	1.000	7 12	265.0	0.993	301.6	0.657	36	264.1	0.936
2 9	259.4	0.989	7 22	261.1	0.996	295.4	0.722	38	262.3	0.967
2 12	255.0	0.955	8 8	257.1	0.977	290.2	0.785	40	260.5	0.972
2 15	250.0	0.897	8 18	252.9	0.937	285.7	0.844	42	258.7	0.950
2 18	244.3	0.820	9 4	248.1	0.879	281.9	0.899	44	256.7	0.905
2 21	237.3	0.728	9 14	242.6	0.804	278.4	0.946	46	254.5	0.837
3 0	228.1	0.629	10 0	235.9	0.718	275.2	0.985	48	251.8	0.748
3 3	215.5	0.533	10 10	227.2	0.627	272.3	1.014	50	248.3	0.641
3 6	198.0	0.457	10 20	215.6	0.539	269.5	1.033	52	243.2	0.520
3 9	175.8	0.423	11 6	200.0	0.468	266.8	1.042	54	235.0	0.393
3 12	153.0	0.446	11 16	180.2	0.430	264.0	1.039	56	219.3	0.272
3 15	134.4	0.515	12 2	159.2	0.439	261.3	1.025	58	185.5	0.192
3 18	120.9	0.608	12 12	140.7	0.490	258.4	0.999	60	140.8	0.216
3 21	111.1	0.708	12 22	126.6	0.569	255.3	0.961	62	115.7	0.320
4 0	103.7	0.802	13 8	116.2	0.660	252.0	0.913	64	103.9	0.447
4 3	97.8	0.882	13 18	108.4	0.750	248.2	0.855	66	97.3	0.573
4 6	92.7	0.944	14 4	102.1	0.834	243.8	0.787	68	93.0	0.691
4 9	88.2	0.984	14 14	96.9	0.904	238.6	0.712	70	89.9	0.794
4 12	83.9	1.000	15 0	92.4	0.956	232.1	0.633	72	87.6	0.882
4 15	79.7	0.991	15 10	88.3	0.989	223.6	0.554	74	85.6	0.950
			15 20	84.4	1.002	212.5	0.481	76	83.8	0.998
			16 6	80.5	0.992	197.9	0.423	78	82.2	1.023
			16 16			179.8	0.392	80	80.6	1.027
			17 2			160.6	0.397			
			17 12			143.3	0.435			
			17 22			129.6	0.498			
			18 8			119.2	0.572			
			18 18			111.3	0.650			
			19 4			105.0	0.724			
			19 14			99.9	0.791			
			20 0			95.5	0.849			
			20 10			91.6	0.895			
			20 20			88.1	0.928			
			21 6			84.7	0.948			
			21 16			81.5	0.954			

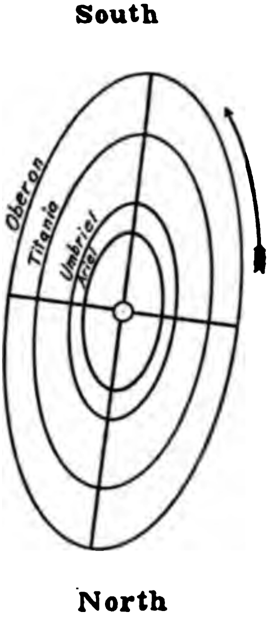
Position angle of satellite $p = p^1 + (P - P_0)$.

Apparent distance of satellite $s = F\frac{a(\rho)}{\rho}$.

Date.	Mimas.		Enceladus.		Tethys.		Dione.	
	$P-P_0$	$\frac{a(\rho)}{\rho}$	$P-P_0$	$\frac{a(\rho)}{\rho}$	$P-P_0$	$\frac{a(\rho)}{\rho}$	$P-P_0$	$\frac{a(\rho)}{\rho}$
	°	″	°	″	°	″	°	″
Jan. 1	0.0	31.8	−0.3	40.8	+0.5	50.5	−0.3	64.7
6	+0.2	31.8	0.3	40.8	0.5	50.5	0.3	64.7
11	0.3	31.8	0.3	40.8	0.6	50.5	0.3	64.6
16	0.5	31.7	0.2	40.7	0.6	50.4	0.3	64.5
21	0.6	31.6	0.2	40.6	0.6	50.2	0.3	64.3
26	+0.8	31.5	−0.2	40.4	+0.6	50.0	−0.3	64.1
31	0.9	31.4	0.2	40.2	0.7	49.8	0.2	63.8
Feb. 5	1.0	31.2	0.2	40.0	0.7	49.5	0.2	63.5
10	1.1	31.0	0.2	39.8	0.7	49.2	0.2	63.1
15	1.2	30.8	0.2	39.5	0.7	48.9	0.2	62.7
20	+1.3	30.6	−0.2	39.2	+0.8	48.6	−0.2	62.2
25	1.4	30.4	0.2	38.9	0.8	48.2	0.2	61.7
Mar. 1	1.5	30.1	0.2	38.6	0.8	47.8	0.2	61.2
6	1.5	29.8	0.2	38.3	0.8	47.4	0.2	60.7
11	1.6	29.5	0.1	37.9	0.8	46.9	0.2	60.1
16	+1.6	29.3	−0.2	37.6	+0.8	46.5	−0.2	59.6
21	1.6	29.0	0.2	37.2	0.8	46.1	0.2	59.0
26	1.6	28.7	0.2	36.9	0.8	45.7	0.2	58.4
31	1.6	28.5	0.2	36.5	0.8	45.2	0.2	57.9
Apr. 5	1.6	28.3	0.2	36.2	0.8	44.8	0.2	57.4
10	+1.5	28.0	−0.2	35.9	+0.9	44.4	−0.2	56.9
15	1.5	27.7	0.2	35.6	0.8	44.0	0.3	56.4
20	1.4	27.5	0.2	35.2	0.8	43.6	0.3	55.9
25	1.3	27.3	0.2	34.9	0.8	43.3	0.3	55.4
30	+1.2	27.0	−0.3	34.7	+0.8	42.9	−0.3	55.0
Sept. 27	−2.2	27.1	−0.7	34.9	+0.4	43.1	−0.7	55.2
Oct. 2	2.1	27.4	0.7	35.1	0.4	43.5	0.7	55.7
7	2.0	27.6	0.7	35.4	0.4	43.8	0.7	56.1
12	1.9	27.8	0.7	35.7	0.4	44.2	0.7	56.6
17	1.8	28.1	0.7	36.0	0.4	44.6	0.7	57.1
22	−1.7	28.4	−0.7	36.4	+0.4	45.0	−0.7	57.7
27	1.5	28.7	0.7	36.7	0.3	45.4	0.7	58.2
Nov. 1	1.4	28.9	0.7	37.1	0.3	45.9	0.7	58.7
6	1.2	29.2	0.7	37.4	0.3	46.3	0.7	59.2
11	1.1	29.4	0.7	37.7	0.3	46.7	0.7	59.8
16	−1.0	29.7	−0.7	38.0	+0.3	47.1	−0.7	60.4
21	0.8	29.9	0.7	38.4	0.3	47.5	0.7	60.9
26	0.7	30.2	0.6	38.7	0.3	47.9	0.7	61.4
Dec. 1	0.5	30.4	0.6	39.0	0.3	48.3	0.7	61.9
6	0.4	30.7	0.6	39.3	0.2	48.7	0.7	62.4
11	−0.3	30.9	−0.6	39.6	+0.2	49.0	−0.7	62.8
16	−0.1	31.1	0.6	39.9	0.2	49.3	0.7	63.2
21	0.0	31.2	0.6	40.1	0.2	49.6	0.7	63.5
26	+0.1	31.4	0.6	40.3	0.2	49.8	0.7	63.8
31	+0.3	31.5	−0.6	40.4	+0.2	50.0	−0.7	64.0

Date.		Rhea.		Titan.		Hyperion.		Iapetus.	
		$P-P_0$	$\frac{a(\rho)}{\rho}$	$P-P_0$	$\frac{a(\rho)}{\rho}$	$P-P_0$	$\frac{a(\rho)}{\rho}$	$P-P_0$	$\frac{a(\rho)}{\rho}$
		°	″	°	″	°	″	°	″
Jan.	1	0.0	90.3	0.0	209	0.0	254	0.0	610
	6	+0.1	90.3	0.0	209	0.0	254	−0.1	610
	11	0.1	90.3	0.0	209	0.0	253	0.1	610
	16	0.1	90.2	0.0	209	0.0	253	0.2	609
	21	0.1	89.9	+0.1	208	+0.1	252	0.3	607
	26	+0.1	89.5	+0.1	207	+0.1	251	−0.4	605
	31	0.1	89.1	0.1	206	0.1	250	0.5	602
Feb.	5	0.2	88.6	0.1	205	0.1	249	0.5	599
	10	0.2	88.1	0.1	204	0.1	247	0.6	596
	15	0.2	87.5	0.1	203	0.1	246	0.7	591
	20	+0.2	86.8	+0.1	201	+0.2	244	−0.7	587
	25	0.2	86.1	0.1	200	0.2	242	0.7	582
Mar.	1	0.2	85.4	0.1	198	0.2	240	0.8	577
	6	0.2	84.7	0.1	196	0.2	238	0.8	572
	11	0.2	83.9	0.1	194	0.2	236	0.8	567
	16	+0.2	83.2	+0.1	193	+0.2	234	−0.8	562
	21	0.2	82.4	0.1	191	0.2	231	0.7	557
	26	0.2	81.7	0.1	189	0.2	229	0.7	551
	31	0.2	80.9	0.1	187	0.1	227	0.7	546
Apr.	5	0.2	80.2	0.1	186	0.1	225	0.6	541
	10	+0.2	79.4	+0.1	184	+0.1	223	−0.6	536
	15	0.1	78.7	0.1	182	0.1	221	0.5	532
	20	0.1	78.0	0.1	181	0.1	219	0.4	527
	25	0.1	77.4	+0.1	179	+0.1	217	0.4	523
	30	+0.1	76.8	0.0	178	0.0	216	−0.3	519
Sept.	27	−0.5	77.1	−0.3	179	−0.4	217	+3.8	521
Oct.	2	0.5	77.8	0.3	180	0.4	218	3.9	525
	7	0.5	78.5	0.3	182	0.4	220	4.0	530
	12	0.5	79.1	0.3	183	0.4	222	4.0	534
	17	0.5	79.8	0.3	185	0.4	224	4.1	539
	22	−0.5	80.5	−0.3	187	−0.4	226	+4.1	544
	27	0.5	81.2	0.3	188	0.4	228	4.2	549
Nov.	1	0.5	82.0	0.3	190	0.4	230	4.2	554
	6	0.5	82.8	0.3	192	0.4	232	4.2	559
	11	0.5	83.6	0.3	194	0.4	235	4.2	564
	16	−0.5	84.3	−0.3	195	−0.4	237	+4.2	569
	21	0.5	85.0	0.3	197	0.4	239	4.2	574
	26	0.5	85.7	0.3	199	0.4	241	4.2	579
Dec.	1	0.5	86.4	0.3	200	0.5	243	4.1	584
	6	0.5	87.1	0.3	202	0.5	244	4.1	588
	11	−0.5	87.7	−0.3	203	−0.5	246	+4.0	592
	16	0.5	88.2	0.3	204	0.5	248	4.0	596
	21	0.5	88.7	0.3	206	0.5	249	3.9	599
	26	0.5	89.1	0.3	207	0.4	250	3.8	602
	31	−0.5	89.4	−0.3	207	−0.4	251	+3.7	604

APPARENT ORBITS OF THE SATELLITES OF URANUS AT DATE OF OPPOSITION, AUGUST 10, 1916, AS SEEN IN AN INVERTING TELESCOPE.



Apparent Apsides.

Date.	Position Angle.	App. Distances. Ariel.	App. Distances. Umbriel.
	°	″	″
May 4,	350.9	13.2	18.4
Aug. 12,	351.6	14.0	19.5
Nov. 20,	352.2	13.1	18.3

Apparent Apsides.

Date.	Position Angle.	App. Distances. Titania.	App. Distances. Oberon.
	°	″	″
May 4,	350.9	30.2	40.4
Aug. 12,	351.6	31.9	42.7
Nov. 20,	352.2	30.0	40.1

GREENWICH MEAN TIME OF GREATEST ELONGATION.

ARIEL.		UMBRIEL.		TITANIA.		OBERON.
North.	South.	North.	South.	North.	South.	North and South.
d h	d h	d h	d h	d h	d h	d h
May 10 21.6	May 14 16.3	May 4 8.9	May 6 10.6	Apr. 29 2.8	May 3 11.2	May 23 18.4 S.
18 11.0	22 5.8	12 15.8	14 17.5	May 7 19.7	12 4.2	30 11.9 N.
26 0.5	29 19.2	20 22.7	23 0.4	16 12.6	20 21.1	June 6 5.5 S.
June 2 13.9	June 6 8.6	29 5.6	31 7.3	25 5.5	29 14.0	12 23.0 N.
10 3.4	13 22.1	June 6 12.5	June 8 14.2	June 2 22.5	June 7 6.9	19 16.6 S.
17 16.8	21 11.6	14 19.4	16 21.2	11 15.4	15 23.9	26 10.2 N.
25 6.3	29 1.0	23 2.3	25 4.1	20 8.4	24 16.8	July 3 3.8 S.
July 2 19.8	July 6 14.5	July 1 9.3	July 3 11.0	29 1.3	July 3 9.8	9 21.4 N.
10 9.2	14 4.0	9 16.2	11 17.9	July 7 18.2	12 2.7	16 14.9 S.
17 22.7	21 17.4	17 23.1	20 0.8	16 11.2	20 19.7	23 8.5 N.
25 12.2	29 6.9	26 6.0	28 7.8	25 4.2	29 12.7	30 2.1 S.
Aug. 2 1.6	Aug. 5 20.4	Aug. 3 13.0	Aug. 5 14.7	Aug. 2 21.2	Aug. 7 5.6	Aug. 5 19.7 N.
9 15.1	13 9.8	11 19.9	13 21.6	11 14.1	15 22.6	12 13.3 S.
17 4.6	20 23.3	20 2.8	22 4.6	20 7.1	24 15.6	19 6.9 N.
24 18.1	28 12.8	28 9.8	30 11.5	29 0.1	Sept. 2 8.6	26 0.5 S.
Sept. 1 7.6	Sept. 5 2.3	Sept. 5 16.7	Sept. 7 18.5	Sept. 6 17.1	11 1.6	Sept. 1 18.2 N.
8 21.0	12 15.8	13 23.7	16 1.4	15 10.1	19 18.6	8 11.8 S.
16 10.5	20 5.3	22 6.6	24 8.4	24 3.0	28 11.5	15 5.4 N.
24 0.0	27 18.7	30 13.6	Oct. 2 15.3	Oct. 2 20.0	Oct. 7 4.5	21 23.0 S.
Oct. 1 13.5	Oct. 5 8.2	Oct. 8 20.5	10 22.2	11 13.0	15 21.5	28 16.6 N.
9 3.0	12 21.7	17 3.4	19 5.2	20 6.0	24 14.4	Oct. 5 10.1 S.
16 16.5	20 11.2	25 10.4	27 12.1	28 22.9	Nov. 2 7.4	12 3.7 N.
24 6.0	28 0.7	Nov. 2 17.3	Nov. 4 19.1	Nov. 6 15.9	11 0.3	18 21.3 S.
31 19.4	Nov. 4 14.2	11 0.3	13 2.0	15 8.8	19 17.3	25 14.9 N.
Nov. 8 8.9	12 3.6	19 7.2	21 8.9	24 1.8	28 10.2	Nov. 1 8.5 S.

For Ariel every third elongation is given, and for Umbriel every alternate one; the intermediate ones may be found by adding multiples of the period of the satellite.

Sidereal period of Ariel, 2^d 12^h.489; of Umbriel, 4^d 3^h.460; of Titania, ^{d} *16^h.941;* of Oberon, 13^d 11^h.118.

Fraction of a Revolution.	Fractions of the Period of Revolution.				Fraction of a Revolution.	p^1	F
	Ariel.	Umbriel.	Titania.	Oberon.			
	d h	d h	d h	d h		°	
0.00	0 0.0	0 0.0	0 0.0	0 0.0	0.00	351.6	1.000
0.02	0 1.2	0 2.0	0 4.2	0 6.5	0.02	355.0	0.994
0.04	0 2.4	0 4.0	0 8.4	0 12.9	0.04	358.6	0.976
0.06	0 3.6	0 6.0	0 12.5	0 19.4	0.06	2.3	0.946
0.08	0 4.8	0 8.0	0 16.7	1 1.8	0.08	6.3	0.906
0.10	0 6.0	0 10.0	0 20.9	1 8.3	0.10	10.7	0.856
0.12	0 7.3	0 11.9	1 1.1	1 14.8	0.12	15.7	0.799
0.14	0 8.5	0 13.9	1 5.3	1 21.2	0.14	21.6	0.736
0.16	0 9.7	0 15.9	1 9.4	2 3.7	0.16	28.5	0.670
0.18	0 10.9	0 17.9	1 13.6	2 10.2	0.18	37.0	0.606
0.20	0 12.1	0 19.9	1 17.8	2 16.6	0.20	47.3	0.549
0.22	0 13.3	0 21.9	1 22.0	2 23.1	0.22	59.8	0.505
0.24	0 14.5	0 23.9	2 2.1	3 5.5	0.24	74.1	0.480
0.26	0 15.7	1 1.9	2 6.3	3 12.0	0.26	89.1	0.480
0.28	0 16.9	1 3.8	2 10.5	3 18.5	0.28	103.4	0.505
0.30	0 18.1	1 5.8	2 14.7	4 0.9	0.30	115.8	0.549
0.32	0 19.4	1 7.8	2 18.9	4 7.4	0.32	126.2	0.606
0.34	0 20.6	1 9.8	2 23.0	4 13.9	0.34	134.6	0.670
0.36	0 21.8	1 11.8	3 3.2	4 20.3	0.36	141.6	0.736
0.38	0 23.0	1 13.8	3 7.4	5 2.8	0.38	147.4	0.799
0.40	1 0.2	1 15.8	3 11.6	5 9.2	0.40	152.5	0.856
0.42	1 1.4	1 17.8	3 15.8	5 15.7	0.42	156.9	0.906
0.44	1 2.6	1 19.8	3 19.9	5 22.2	0.44	160.9	0.946
0.46	1 3.8	1 21.8	4 0.1	6 4.6	0.46	164.6	0.976
0.48	1 5.0	1 23.7	4 4.3	6 11.1	0.48	168.1	0.994
0.50	1 6.2	2 1.7	4 8.5	6 17.6	0.50	171.6	1.000
0.52	1 7.5	2 3.7	4 12.6	7 0.0	0.52	175.0	0.994
0.54	1 8.7	2 5.7	4 16.8	7 6.5	0.54	178.6	0.976
0.56	1 9.9	2 7.7	4 21.0	7 12.9	0.56	182.3	0.946
0.58	1 11.1	2 9.7	5 1.2	7 19.4	0.58	186.3	0.906
0.60	1 12.3	2 11.7	5 5.4	8 1.9	0.60	190.7	0.856
0.62	1 13.5	2 13.7	5 9.5	8 8.3	0.62	195.7	0.799
0.64	1 14.7	2 15.7	5 13.7	8 14.8	0.64	201.6	0.736
0.66	1 15.9	2 17.6	5 17.9	8 21.3	0.66	208.5	0.670
0.68	1 17.1	2 19.6	5 22.1	9 3.7	0.68	217.0	0.606
0.70	1 18.3	2 21.6	6 2.3	9 10.2	0.70	227.3	0.549
0.72	1 19.6	2 23.6	6 6.4	9 16.6	0.72	239.8	0.505
0.74	1 20.8	3 1.6	6 10.6	9 23.1	0.74	254.1	0.480
0.76	1 22.0	3 3.6	6 14.8	10 5.6	0.76	269.1	0.480
0.78	1 23.2	3 5.6	6 19.0	10 12.0	0.78	283.4	0.505
0.80	2 0.4	3 7.6	6 23.2	10 18.5	0.80	295.8	0.549
0.82	2 1.6	3 9.6	7 3.3	11 1.0	0.82	306.2	0.606
0.84	2 2.8	3 11.5	7 7.5	11 7.4	0.84	314.6	0.670
0.86	2 4.0	3 13.5	7 11.7	11 13.9	0.86	321.6	0.736
0.88	2 5.2	3 15.5	7 15.9	11 20.3	0.88	327.4	0.799
0.90	2 6.4	3 17.5	7 20.0	12 2.8	0.90	332.5	0.856
0.92	2 7.7	3 19.5	8 0.2	12 9.3	0.92	336.9	0.906
0.94	2 8.9	3 21.5	8 4.4	12 15.7	0.94	340.9	0.946
0.96	2 10.1	3 23.5	8 8.6	12 22.2	0.96	344.6	0.976
0.98	2 11.3	4 1.5	8 12.8	13 4.7	0.98	348.1	0.994
1.00	2 12.5	4 3.5	8 16.9	13 11.1	1.00	351.6	1.000

The fraction of a revolution is reckoned from the Northern Elongation.
Position angle of satellite $p = p^1 + (P - P_0)$.

Apparent distance of satellite $s = F\frac{a(\rho)}{\rho}$.

SATELLITES OF URANUS, 1916.

Date.	$P-P_0$	$\frac{a(\rho)}{\rho}$				Date.	$P-P_0$	$\frac{a(\rho)}{\rho}$			
		Ariel.	Umbriel.	Titania.	Oberon.			Ariel.	Umbriel.	Titania.	Oberon.
	°	″	″	″	″		°	″	″	″	″
Apr. 15	−0.5	13.0	18.1	29.7	39.8	Aug. 13	0.0	14.0	19.5	31.9	42.7
20	0.6	13.1	18.2	29.8	39.9	18	+0.1	14.0	19.4	31.9	42.7
25	0.6	13.1	18.3	30.0	40.1	23	0.2	13.9	19.4	31.9	42.6
30	0.6	13.2	18 3	30.1	40.2	28	0.3	13.9	19.4	31.8	42.6
May 5	0.7	13.2	18.4	30.2	40.4	Sept 2	0.3	13.9	19.4	31.8	42.5
10	−0.7	13.3	18.5	30.3	40.6	7	+0.4	13.9	19.3	31.7	42.4
15	0.7	13.3	18.6	30.5	40.8	12	0.5	13.8	19.3	31.6	42.3
20	0.7	13.4	18.7	30.6	40.9	17	0.5	13.8	19.2	31.6	42.2
25	0.7	13.4	18.7	30.7	41.1	22	0.6	13.8	19.2	31.5	42.1
30	0.7	13.5	18.8	30.9	41.3	27	0.6	13.7	19.1	31.4	42.0
June 4	−0.7	13.6	18.9	31.0	41.4	Oct. 2	+0.6	13.7	19.1	31.3	41.8
9	0.7	13.6	19.0	31.1	41.6	7	0.7	13.6	19.0	31.1	41.7
14	0.6	13.6	19.0	31.2	41.7	12	0.7	13.6	18.9	31.0	41.5
19	0.6	13.7	19.1	31.3	41.9	17	0.7	13.5	18.8	30.9	41.3
24	0.6	13.7	19.2	31.4	42.0	22	0.7	13.5	18.8	30.8	41.2
29	−0.5	13.8	19.2	31.5	42.2	27	+0.7	13.4	18.7	30.6	41.0
July 4	0.5	13.8	19.3	31.6	42.3	Nov. 1	0.7	13.4	18.6	30.5	40.8
9	0.4	13.9	19.3	31.7	42.4	6	0.7	13.3	18.5	30.4	40.6
14	0.4	13.9	19.4	31.8	42.5	11	0.7	13.2	18.4	30.2	40.5
19	0.3	13.9	19.4	31.8	42.5	16	0.6	13.2	18.4	30.1	40.3
24	−0.2	13.9	19.4	31.9	42.6	21	+0.6	13.1	18.3	30.0	40.1
29	0.2	14.0	19.4	31.9	42.7	26	0.5	13.1	18.2	29.9	39.9
Aug. 3	−0.1	14.0	19.4	31.9	42.7	Dec. 1	0.5	13.0	18.2	29.8	39.8
8	0.0	14.0	19.5	31.9	42.7	6	+0.4	13.0	18.1	29.6	39.6

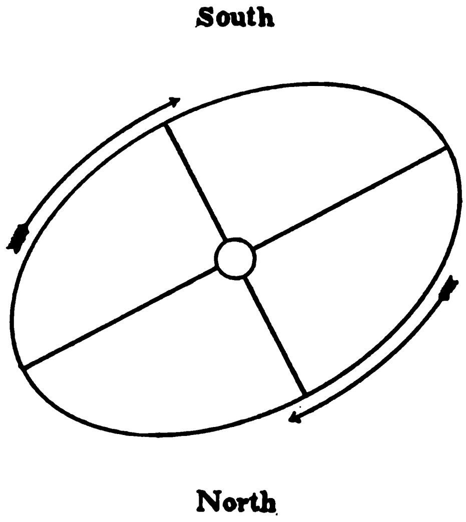
SATELLITE OF NEPTUNE, 1916.

Time from Eastern Elongation.	p^1	F	Time from Eastern Elongation.	p^1	F	Date.	$P-P_0$	$\frac{a(\rho)}{\rho}$	Date.	$P-P_0$	$\frac{a(\rho)}{\rho}$
d h	°		d h	°			°	″		°	″
0 0	117.7	1.000	3 0	295.3	0.999	Jan. 1	+0.6	16.8	Apr. 30	−1.6	16.2
0 3	112.8	0.995	3 3	290.4	0.988	6	0.5	16.8	May 5	1.5	16.1
0 6	107.8	0.979	3 6	285.3	0.968	11	0.3	16.8	10	1.4	16.1
0 9	102.6	0.954	3 9	279.9	0.940	16	+0.2	16.8	15	1.3	16.0
0 12	97.0	0.920	3 12	274.1	0.901	21	0.0	16.8	20	−1.2	16.0
0 15	90.9	0.879	3 15	267.8	0.857	26	−0.2	16.8	Oct. 2	+3.6	16.0
0 18	84.3	0.833	3 18	260.7	0.810	31	0.3	16.8	7	3.7	16.1
0 21	76.8	0.786	3 21	252.8	0.762	Feb. 5	0.5	16.8	12	3.8	16.1
1 0	68.3	0.738	4 0	243.8	0.716	10	0.6	16.8	17	3.8	16.2
1 3	58.8	0.696	4 3	233.7	0.679	15	0.8	16.8	22	3.9	16.2
1 6	48.2	0.664	4 6	222.7	0.652	20	−0.9	16.7	27	+3.9	16.2
1 9	36.7	0.644	4 9	210.9	0.640	25	1.1	16.7	Nov. 1	4.0	16.3
1 12	24.8	0.640	4 12	198.9	0.643	Mar. 1	1.2	16.7	6	4.0	16.3
1 15	13.0	0.652	4 15	187.4	0.663	6	1.3	16.6	11	4.0	16.4
1 18	1.9	0.678	4 18	176.8	0.696	11	1.4	16.6	16	3.9	16.4
1 21	351.8	0.716	4 21	167.2	0.738	16	−1.5	16.6	21	+3.9	16.5
2 0	342.8	0.761	5 0	158.8	0.785	21	1.6	16.5	26	3.8	16.5
2 3	334.9	0.809	5 3	151.3	0.833	26	1.6	16.5	Dec. 1	3.7	16.6
2 6	327.8	0.856	5 6	144.6	0.878	31	1.7	16.4	6	3.6	16.6
2 9	321.4	0.900	5 9	138.6	0.919	Apr. 5	1.7	16.4	11	3.5	16.6
2 12	315.6	0.938	5 12	133.0	0.953	10	−1.7	16.4	16	+3.4	16.7
2 15	310.3	0.967	5 15	127.7	0.978	15	1.7	16.3	21	3.3	16.7
2 18	305.2	0.988	5 18	122.7	0.995	20	1.7	16.3	26	3.2	16.7
2 21	300.2	0.999	5 21	117.8	1.000	25	−1.6	16.2	31	+3.1	16.8

Position angle of satellite $p=p^1+(P-P_0)$.

Apparent distance of satellite $s=F\frac{a(\rho)}{\rho}$.

APPARENT ORBIT OF THE SATELLITE OF NEPTUNE AT DATE OF OPPOSITION, JANUARY 22, 1916, AS SEEN IN AN INVERTING TELESCOPE.



Date.	Position Angle of Apsis.	Apparent Distance at Apsis.
	°	″
Jan. 21	117.7	16.8
Apr. 30	116.1	16.2
Oct. 11	121.5	16.1
Dec. 30	120.9	16.7

GREENWICH MEAN TIME OF GREATEST ELONGATION.

East.		West.		East.		West.		East.		West.	
	d h		d h		d h		d h		d h		d h
Jan.	3 16.6	Jan.	6 15.1	Mar.	26 0.2	Mar.	28 22.7	Oct.	11 17.5	Oct.	14 16.0
	9 13.7		12 12.2		31 21.2	Apr.	3 19.8		17 14.5		20 13.0
	15 10.8		18 9.4	Apr.	6 18.3		9 16.9		23 11.5		26 10.0
	21 7.9		24 6.5		12 15.4		15 13.9		29 8.5	Nov.	1 7.0
	27 5.1		30 3.6		18 12.4		21 11.0	Nov.	4 5.5		7 4.0
Feb.	2 2.2	Feb.	5 0.7		24 9.5		27 8.0		10 2.5		13 1.1
	7 23.3		10 21.9		30 6.5	May	3 5.0		15 23.6		18 22.1
	13 20.4		16 19.0	May	6 3.5		9 2.0		21 20.6		24 19.1
	19 17.5		22 16.1		12 0.5		14 23.0		27 17.7		30 16.2
	25 14.7		28 13.2		17 21.5		20 20.0	Dec.	3 14.8	Dec.	6 13.3
Mar.	2 11.8	Mar.	5 10.3		23 18.5		26 17.0		9 11.8		12 10.3
	8 8.9		11 7.4		. . . . .		. . . . .		15 8.9		18 7.4
	14 6.0		17 4.5	Sept.	29 23.5	Oct.	2 22.0		21 6.0		24 4.6
	20 3.1		23 1.6	Oct.	5 20.5		8 19.0		27 3.1		30 1.7

The above times are the instants of each passage of the satellite through the psis of its apparent orbit. The position of the satellite at any other time ay be found by measuring around the orbit from the apsis last passed through, earing in mind that the radius vector of the satellite describes equal areas equal times.

The sidereal period of the satellite of Neptune is 5ᵈ 21ʰ.044.

Note.—In the preceding diagrams the central circle represents the planet and is on the same scale as the orbits.

GREENWICH MEAN TIME.

PLANETARY CONFIGURATIONS.

	d	h	m			°	′
Jan.	1	8	–	♀	Greatest Hel. Lat. S.		
	1	14	–	♂	Stationary.		
	2	1	–	⊕	in Perihelion.		
	2	8	–	☿	Greatest Hel. Lat. S.		
	4	5	–	☍ ♄ ☉			
	5	13	48	☌ ☿ ☾	. . . . ☿ −	1	1
	6	8	–	☌ ♀ ♅	. . . . ♀ −	1	7
	6	18	18	☌ ♅ ☾	. . . . ♅ −	1	17
	6	19	13	☌ ♀ ☾	. . . . ♀ −	2	27
	9	17	33	☌ ♃ ☾	. . . . ♃ −	5	34
	17	6	–	☌ ☿ ♅	. . . . ☿ −	0	15
	18	9	39	☌ ♄ ☾	. . . . ♄ −	2	49
	19	–	–	☾	Par. ecl. vis. at Wash.		
	20	0	48	☌ ♆ ☾	. . . . ♆ −	0	58
	20	6	–	☿	Great. elong. E.	18	40
	21	8	–	☿	in ☊		
	22	3	–	☍ ♆ ☉			
	22	7	28	☌ ♂ ☾	. . . . ♂ +	6	35
	25	23	–	☿	in Perihelion.		
	26	10	–	☿	Stationary.		
Feb.	3	–	–	☉	Tot. ecl. vis. at Wash.		
	3	8	8	☌ ♅ ☾	. . . . ♅ −	1	27
	3	8	24	☌ ☿ ☾	. . . . ☿ +	2	47
	3	12	–	☌ ☿ ♅	. . . . ☿ +	4	15
	4	20	–	☌ ☿ ☉	Inferior.		
	5	6	–	☿	Greatest Hel. Lat N.		
	5	7	–	☌ ♅ ☉			
	5	23	6	☌ ♀ ☾	. . . . ♀ −	5	16
	6	12	55	☌ ♃ ☾	. . . . ♃ −	5	52
	7	0	–	♂	Greatest Hel. Lat. N.		
	8	23	–	♂	Nearest ⊕		
	9	14	–	☍ ♂ ☉			
	13	15	–	☌ ♀ ♃	. . . . ♀ +	0	27
	14	13	20	☌ ♄ ☾	. . . . ♄ −	2	54
	16	6	24	☌ ♆ ☾	. . . . ♆ −	1	2
	16	18	–	☿	Stationary.		
	17	18	16	☌ ♂ ☾	. . . . ♂ +	5	44
	26	15	–	♀	in ☊		
	28	17	–	☿	in ☋		
Mar.	1	12	–	☿	Greatest elong. W.	27	6
	1	15	17	☌ ☿ ☾	. . . . ☿ −	0	58
	1	20	40	☌ ♅ ☾	. . . . ♅ −	1	37
	4	13	–	☌ ☿ ♅	. . . . ☿ −	0	8
	5	10	16	☌ ♃ ☾	. . . . ♃ −	6	5
	7	1	17	☌ ♀ ☾	. . . . ♀ −	4	50
	9	23	–	☿	in Aphelion.		
	11	0	–	♄	Stationary.		
	11	0	–	♃	Greatest Hel. Lat. S.		
	12	20	3	☌ ♄ ☾	. . . . ♄ −	2	45
	13	15	–	♂	in Aphelion.		
	14	13	24	☌ ♆ ☾	. . . . ♆ −	0	58
	15	12	51	☌ ♂ ☾	. . . . ♂ +	4	15
	20	10	47	☉	enters ♈, Spring com.		
Mar.	22	1	–	♂	Stationary.		
	29	6	25	☌ ♅ ☾	. . . . ♅ −	1	53
	30	7	–	☿	Greatest Hel. Lat. S.		
	30	10	–	□ ♄ ☉			
	31	4	–	♀	in Perihelion.		
Apr.	1	2	–	☌ ♃ ☉			
	1	8	45	☌ ☿ ☾	. . . . ☿ −	6	52
	2	7	23	☌ ♃ ☾	. . . . ♃ −	6	17
	6	0	8	☌ ♀ ☾	. . . . ♀ −	2	0
	8	21	–	☌ ☿ ♃	. . . . ☿ −	0	24
	9	5	46	☌ ♄ ☾	. . . . ♄ −	2	24
	9	23	–	♆	Stationary.		
	10	21	27	☌ ♆ ☾	. . . . ♆ −	0	45
	12	2	0	☌ ♂ ☾	. . . . ♂ +	3	37
	14	9	–	☌ ☿ ☉	Superior.		
	17	13	–	♃	in Perihelion.		
	18	8	–	☿	in ☊		
	19	19	–	□ ♆ ☉			
	22	3	–	♀	Greatest Hel. Lat. N.		
	22	22	–	☿	in Perihelion.		
	23	22	–	♀	Greatest elong. E.	45	39
	25	13	43	☌ ♅ ☾	. . . . ♅ −	2	14
	30	2	54	☌ ♃ ☾	. . . . ♃ −	6	29
May	3	5	–	☿	Greatest Hel. Lat. N.		
	3	9	56	☌ ☿ ☾	. . . . ☿ −	2	6
	5	17	33	☌ ♀ ☾	. . . . ♀ +	1	1
	6	17	31	☌ ♄ ☾	. . . . ♄ −	1	56
	8	5	51	☌ ♆ ☾	. . . . ♆ −	0	27
	10	3	–	□ ♅ ☉			
	10	4	41	☌ ♂ ☾	. . . . ♂ +	3	54
	12	4	–	☿	Greatest elong. E.	21	43
	14	12	–	□ ♂ ☉			
	22	20	11	☌ ♅ ☾	. . . . ♅ −	2	33
	23	20	–	☌ ♀ ♄	. . . . ♀ +	3	25
	24	15	–	♅	Stationary.		
	24	21	–	☿	Stationary.		
	26	16	–	☿	in ☋		
	27	2	–	♀	Greatest brilliancy.		
	27	20	20	☌ ♃ ☾	. . . . ♃ −	6	41
	31	23	22	☌ ☿ ☾	. . . . ☿ −	4	55
June	3	6	18	☌ ♄ ☾	. . . . ♄ −	1	29
	3	13	38	☌ ♀ ☾	. . . . ♀ +	1	36
	4	14	5	☌ ♆ ☾	. . . . ♆ −	0	10
	5	13	–	☌ ☿ ☉	Inferior.		
	5	22	–	☿	in Aphelion.		
	7	14	32	☌ ♂ ☾	. . . . ♂ +	4	38
	11	4	–	♀	Stationary.		
	17	4	–	♀	in ☋		
	17	13	–	☿	Stationary.		
	19	3	25	☌ ♅ ☾	. . . . ♅ −	2	44
	21	6	24	☉	enters ♋, Summer com.		
	22	3	–	☌ ♀ ♄	. . . . ♀ −	0	57
	24	11	42	☌ ♃ ☾	. . . . ♃ −	6	52

GREENWICH MEAN TIME.

PLANETARY CONFIGURATIONS.

		°	′		d	h	m			°	′
☿	Greatest Hel. Lat. S.			Sept.	22	6	–	☿	Stationary.		
☌ ☿ ☾	.... ☿	− 7	7		22	19	41	☌ ♀ ☾	.... ♀	+ 0	12
☿	Great. elong. W.	21	52		22	21	14	☉	enters ♎, Autumn com.		
☌ ♀ ☾	.... ♀	− 4	30		27	4	–	♄	in ☊		
☌ ♄ ☾	.... ♄	− 1	6		28	0	11	☌ ☿ ☾	.... ☿	+ 1	30
☌ ♆ ☾	.... ♆	+ 0	6		30	0	1	☌ ♂ ☾	.... ♂	+ 4	30
⊕	in Aphelion.			Oct.	4	23	–	☌ ☿ ☉	Inferior.		
☌ ♀ ☉	Inferior.				6	11	40	☌ ♅ ☾	.... ♅	− 2	39
☌ ♂ ☾	.... ♂	+ 5	22		8	8	–	♀	in ☊		
☌ ♄ ☉					11	6	–	☿	in ☊		
☌ ☿ ♀	.... ☿	+ 5	1		12	0	21	☌ ♃ ☾	.... ♃	− 6	54
☾	Par. ecl. vis. at Wash.				13	7	–	☿	Stationary.		
☿	in ☊				15	21	–	☿	in Perihelion.		
☌ ♅ ☾	.... ♅	− 2	44		18	23	5	☌ ♄ ☾	.... ♄	+ 0	34
☿	in Perihelion.				19	8	46	☌ ♆ ☾	.... ♆	+ 0	42
☌ ☿ ♄	.... ☿	+ 1	9		20	10	–	☿	Great. elong. W.	18	17
♀	in Aphelion.				23	1	47	☌ ♀ ☾	.... ♀	+ 5	35
☌ ♃ ☾	.... ♃	− 6	57		23	13	–	□ ♄ ☉			
♀	Stationary.				23	14	–	☍ ♃ ☉			
☌ ♆ ☉					25	5	24	☌ ☿ ☾	.... ☿	+ 7	40
☌ ☿ ♆	.... ☿	+ 1	53		25	20	–	♅	Stationary.		
☌ ♀ ☾	.... ♀	− 8	21		26	3	–	☿	Greatest Hel. Lat. N.		
□ ♃ ☉					28	3	–	□ ♆ ☉			
☌ ☿ ☉	Superior.				28	16	46	☌ ♂ ☾	.... ♂	+ 3	3
☌ ♄ ☾	.... ♄	− 0	44	Nov.	2	17	14	☌ ♅ ☾	.... ♅	− 2	53
☉	Ann. ecl. invis. at Wash.				7	0	–	♆	Stationary.		
☌ ♆ ☾	.... ♆	+ 0	5		8	2	–	□ ♅ ☉			
☌ ☿ ☾	.... ☿	+ 2	50		8	2	31	☌ ♃ ☾	.... ♃	− 6	56
☿	Greatest Hel. Lat. N.				11	2	–	♀	in Perihelion.		
☌ ♂ ☾	.... ♂	+ 5	42		11	22	–	♄	Stationary.		
♀	Greatest brilliancy.				15	8	22	☌ ♄ ☾	.... ♄	+ 0	56
☍ ♅ ☉					15	17	9	☌ ♆ ☾	.... ♆	+ 1	0
☌ ♅ ☾	.... ♅	− 2	37		18	15	–	☿	in ☋		
♀	Greatest Hel. Lat. S.				22	6	32	☌ ♀ ☾	.... ♀	+ 7	33
☌ ♃ ☾	.... ♃	− 6	58		23	14	–	☌ ☿ ☉	Superior.		
♂	in ☋				24	23	17	☌ ☿ ☾	.... ☿	+ 3	5
☿	in ☋				26	11	57	☌ ♂ ☾	.... ♂	+ 1	12
☌ ♀ ☾	.... ♀	− 5	23		28	20	–	☿	in Aphelion.		
☌ ♄ ☾	.... ♄	− 0	21		29	23	54	☌ ♅ ☾	.... ♅	− 3	10
♃	Stationary.			Dec.	2	20	–	♀	Greatest Hel. Lat. N.		
☌ ♆ ☾	.... ♆	+ 0	12		5	4	36	☌ ♃ ☾	.... ♃	− 7	0
☌ ☿ ☾	.... ☿	+ 3	54		12	14	13	☌ ♄ ☾	.... ♄	+ 1	4
☌ ♂ ☾	.... ♂	+ 5	25		13	0	5	☌ ♆ ☾	.... ♆	+ 1	8
☿	in Aphelion.				19	5	–	☿	Greatest Hel. Lat. S.		
☌ ♀ ♄	.... ♀	− 3	0		21	1	–	♃	Stationary.		
☌ ♅ ☾	.... ♅	− 2	33		21	15	59	☉	enters ♑, Winter com.		
☿	Great. elong. E.	26	54		21	23	–	☌ ☿ ♂	.... ☿	− 1	10
♀	Great. elong. W.	46	1		22	5	46	☌ ♀ ☾	.... ♀	+ 5	34
☌ ♀ ♆	.... ♀	− 2	3		24	–	–	☉	Par. ecl. invis. at Wash.		
☌ ♃ ☾	.... ♃	− 6	55		25	10	4	☌ ♂ ☾	.... ♂	− 0	57
☌ ♄ ☾	.... ♄	+ 0	6		25	14	36	☌ ☿ ☾	.... ☿	− [illegible]	13
☌ ♆ ☾	.... ♆	+ 0	25		27	9	42	☌ ♅ ☾	.... ♅	− 3	22
☿	Greatest Hel. Lat. S.										

No.	Place.	Latitude.	Reduction to Geocentric Latitude.	Altitude (*Meters*).	Log ρ (*Including altitude*).	Longitude from Greenwich.	Reduction from Greenwich to Local S.T.M.N.
		° ′ ″	′ ″			h m s	s
1	Abbadia, France . . .	+43 22 52.2	−11 34.4	69	9.999317	+ 0 7 0.1	+ 1.15
2	Adelaide, S. Australia .	−34 55 38.0[a]	+10 52.4	41[b]	9.999526	− 9 14 20.07[a]	− 91.06
3	Adelaide, S. Australia .	−34 55 37.4[c]	+10 52.4	. . .	9.999523	− 9 14 20.17[c]	− 91.06
4	Albany, N. Y. . . .	+42 39 12.7[a]	−11 33.1	70[a]	9.999336	+ 4 55 7.12[a]	+ 48.48
5	Albany, N. Y. . . .	+42 39 49.5[a]	−11 33.1	52	9.999335	+ 4 54 59.97[a]	+ 48.46
6	Algiers, Algeria . . .	+36 47 50	−11 6.7	342	9.999501	− 0 12 8.38	− 1.99
7	Allegheny, Pa. . . .	+40 28 58.1[d]	−11 26.7	370[d]	9.999411	+ 5 20 5.39[d]	+ 52.58
8	Allegheny, Pa. . . .	+40 27 41.6	−11 26.6	. . .	9.999387	+ 5 20 2.93	+ 52.58
9	Amherst, Mass. . . .	+42 21 56.5[e]	−11 32.5	110[e]	9.999346	+ 4 50 5.93[e]	+ 47.66
10	Amherst, Mass. . . .	+42 22 17.1[f]	−11 32.5	. . .	9.999338	+ 4 50 4.67[f]	+ 47.65
11	Ann Arbor, Mich. . .	+42 16 48.7[a]	−11 32.3	282[a]	9.999360	+ 5 34 55.27[a]	+ 55.02
12	Appleton, Wis. . . .	+44 15 39.2[g]	−11 35.4	242	9.999307	+ 5 53 35.92[g]	+ 58.09
13	Arcetri, Italy	+43 45 14.4	−11 34.9	184	9.999316	− 0 45 1.30	− 7.40
14	Arequipa, Peru . .	−16 22 28.0[h]	+ 6 15.2	2451[h]	0.000052	+ 4 46 11.73[h]	+ 47.02
15	Armagh, Ireland . . .	+54 21 12.7[c]	−10 59.6	61[c]	9.999040	+ 0 26 35.4[c]	+ 4.37
16	Athens, Greece . . .	+37 58 19.7[i]	−11 14.3	107[i]	9.999456	− 1 34 53[i]	− 15.59
17	Baltimore, Md. . . .	+39 17 52.0[j]	−11 21.5	36[j]	9.999418	+ 5 6 29.1[j]	+ 50.35
18	Bamberg, Bavaria . .	+49 53 6.0[c]	−11 26.0	299[c]	9.999167	− 0 43 33.57[c]	− 7.16
19	Barcelona, Spain . .	+41 25 18	−11 30.0	420	9.999391	− 0 8 28.0	− 1.39
20	Beloit, Wis.	+42 30 8.4	−11 32.8	. . .	9.999335	+ 5 56 7.4	+ 58.50
21	Bergedorf, Germany .	+53 28 46.2	−11 6.1	35	9.999060	− 0 40 57.74	− 6.73
22	Berkeley, Cal. . . .	+37 52 23.6	−11 13.7	97	9.999458	+ 8 9 2.72	+ 80.34
23	Berlin, Prussia . . .	+52 30 16.7[k]	−11 12.5	47[k]	9.999085	− 0 53 34.80[k]	− 8.80
24	Berlin, Prussia . . .	+52 31 13.1	−11 12.4	. . .	9.999081	− 0 53 34.41	− 8.80
25	Berlin, Prussia . . .	+52 31 30.7	−11 12.4	. . .	9.999081	− 0 53 27.40	− 8.78
26	Berlin, Prussia . . .	+52 29 7	−11 12.6	38	9.999084	− 0 53 54.2	− 8.86
27	Berne, Switzerland . .	+46 57 8.7	−11 34.2	573	9.999260	− 0 29 45.70[a]	− 4.89
28	Besançon, France . .	+47 14 59.0	−11 33.7	312	9.999235	− 0 23 57.13	− 3.93
29	Birr Castle, Ireland . .	+53 5 47	−11 8.7	56	9.999071	+ 0 31 40.9	+ 5.20
30	Bloomington, Ind. . .	+39 9 56[d]	−11 20.8	238[d]	9.999435	+ 5 46 5[d]	+ 56.85
31	Bogota, Colombia . .	+ 4 35 55.2[c]	− 1 50.8	2634	0.000170	+ 4 56 23.5	+ 48.69
32	Bombay (Colaba), India	+18 53 36.2[c]	− 7 5.1	14[c]	9.999849	− 4 51 15.72[c]	− 47.85
33	Bonn, Prussia	+50 43 45.0[k]	−11 22.3	62[l]	9.999130	− 0 28 23.17[k]	− 4.66
34	Bordeaux (Floirac), France	+44 50 7.2[a]	−11 35.6	73	9.999281	+ 0 2 5.51[a]	+ 0.34
35	Boston, Mass	+42 20 58[m]	−11 32.5	31[m]	9.999341	+ 4 44 19.1[m]	+ 46.71
36	Boston, Mass	+42 21 32.5	−11 32.5	48	9.993342	+ 4 44 15.0	+ 46.70
37	Bothkamp, Prussia . .	+54 12 9.6[n]	−11 0.8	32[n]	9.999042	− 0 40 31.02[n]	− 6.66
38	Bremen, Germany . .	+53 4 36	−11 8.8	. . .	9.999067	− 0 35 15	− 5.79
39	Breslau, Prussia . . .	+51 6 55.8[k]	−11 20.4	147[k]	9.999126	− 1 8 8.72[k]	− 11.20
40	Brisbane, Queensland .	−27 28 0.0	+ 9 28.3	. . .	9.999691	−10 12 6.17	−100.55
41	Brussels (Uccle), Belgium	+50 47 55.5[a]	−11 21.9	105[a]	9.999131	− 0 17 26.05[a]	− 2.86
42	Brussels, Belgium . .	+50 51 10.6[c]	−11 21.7	. . .	9.999123	− 0 17 28.02[c]	− 2.87
43	Budapest, Hungary . .	+47 29 34.7[c]	−11 33.2	131[c]	9.999217	− 1 16 15.3[c]	− 12.53
44	Cambridge, England .	+52 12 51.6	−11 14.3	28	9.999091	− 0 0 22.75	− 0.06
45	Cambridge, Mass. . .	+42 22 47.6[o]	−11 32.6	24	9.999340	+ 4 44 31.05[o]	+ 46.74
46	Cape of Good Hope . .	−33 56 3.5[p]	+10 43.6	13[p]	9.999548	− 1 13 54.76[p]	− 12.14
47	Carloforte, Sardinia . .	+39 8 8.9[q]	−11 20.7	18[q]	9.999421	− 0 33 14.9[q]	− 5.46
48	Catania, Sicily . . .	+37 30 13.2[c]	−11 11.4	49[c]	9.999464	− 1 0 20.70[c]	− 9.91
49	Charkow, Russia . . .	+50 0 9.9[a]	−11 25.5	138[r]	9.999153	− 2 24 55.75[a]	− 23.81
50	Charlottesville, Va. . .	+38 2 1.2[e]	−11 14.6	259[e]	9.999465	+ 5 14 5.33[e]	+ 51.60

[a] Meridian circle.
[b] Standard barometer.
[c] Transit instrument.
[d] Transit instrument pier.
[e] Center of large dome.
[f] Center of dome tower.
[g] Center of dome.
[h] Transit pier.
[i] Cercle Syngros.
[j] Center of instrument house.
[k] Center of observatory.
[l] Floor of meridian room.
[m] Foot of pillar of 7-in. equatorial.
[n] Cube of equatorial.
[o] Dome of 15-in. equatorial.
[p] 8-in. meridian circle.
[q] Zenith telescope.
[r] Barometer in meridian room.

No.	Authority for—		Description.
	Latitude.	Longitude.	
1	*Les Obs. Astron.*, Bruxelles, 1907.	*Les Obs. Astron.*, Bruxelles, 1907.	Obs. Paris Acad. of Sci., Hendaye.
2	Letter from Govt. Astronomer, 1913.	Letter from Govt. Astronomer, 1913.	Govt. Obs., since 1884.
3	Letter from Govt. Astronomer, 1913.	Letter from Govt. Astronomer, 1913.	Govt. Obs., before 1884.
4	Letter from Director, 1913.	Letter from Director, 1913.	Dudley Obs., since 1893.
5	Letter from Director, 1913.	Letter from Director, 1913.	Dudley Obs., before 1893.
6	*Les Obs. Astron.*, Bruxelles, 1907.	*Astron. Nach.*, Nr. 3993, 1905.	At Bouzaréah. Old Obs. 3′.8 S., 8^s E.
7	*Publications* of Obs., 1909.	*Publications* of Obs., 1909.	[a] Obs. Western Univ. of Pa., since 1905.
8	Letter from Director, 1897.	Letter from Director, 1897.	Obs. Western Univ. of Pa., before 1905.
9	Letter from Director, 1913.	Letter from Director, 1913.	Amherst College Obs., since 1903.
10	Letter from Director, 1913.	Letter from Director, 1913.	Lawrence Obs., before 1903.
11	Letter from Director, 1913.	Letter from Director, 1913.	Detroit Obs., Univ. of Mich.
12	See footnote ([b]).	See footnote ([b]).	Underwood Obs., Lawrence College.
13	*Pubbl. dell'Osserv.*, 1900.	*Astron. Nach.*, Nr. 3993, 1905.	Royal Observatory.
14	*Harvard Annals*, 1903.	*Harvard Annals*, 1903.	Branch of Harvard Coll. Obs.
15	*Armagh Catalogue of Stars*, 1840.	*Armagh Catalogue of Stars*, 1840.	Armagh Observatory.
16	*Annales de l'Obs.*, 1910.	Letter from Director, 1913.	[c] National Observatory.
17	Letter from Director, 1913.	Letter from Director, 1913.	Johns Hopkins Univ. Obs.
18	Letter from Director, 1913.	*Astron. Nach.*, Nr. 3993, 1905.	Remeis Observatory.
19	*Les Obs. Astron.*, Bruxelles, 1907.	*Les Obs. Astron.*, Bruxelles, 1907.	Fabra Obs., Acad. of Sci. and Arts.
20	Letter from Director, 1897.	Letter from Director, 1897.	Smith Obs., Beloit College.
21	Letter from Director, 1913.	*Astron. Nach.*, Nr. 3993, 1905.	Hamburg Obs., since 1909.
22	Letter from Director, 1897.	Letter from Director, 1897.	Students' Obs., Univ. of Cal.
23	*Astron. Nach.*, Nr. 3545, 1898.	*Astron. Nach.*, Nr. 3993, 1905.	Royal Obs., since 1835.
24	Letter from Director, 1913.	Letter from Director, 1913.	Royal Obs., before 1835.
25	*Astron. Nach.*, Nr. 3170, 1893.	*Astron. Nach.*, Nr. 3170, 1893.	Urania Observatory.
26	*Les Obs. Astron.*, Bruxelles, 1907.	*Les Obs. Astron.*, Bruxelles, 1907.	Treptow Observatory.
27	*Berliner Jahrbuch.*	*Astron. Nach.*, Nr. 3202, 1893.	Observatory, Cantonal Univ.
28	*Astron. Nach.*, Nr. 2805, 1887.	*Astron. Nach.*, Nr. 2805, 1887.	National Observatory.
29	British *Nautical Almanac.*	British *Nautical Almanac.*	Private Obs. of Earl of Rosse.
30	Letter from Director, 1913.	Letter from Director, 1913.	Kirkwood Obs., Univ. of Ind.
31	Letter from Director, 1913.	Letter from Director, 1913.	National Observatory.
32	Letter from Director, 1913.	Letter from Director, 1913.	Government Observatory.
33	Letter from Director, 1913.	*Astron. Nach.*, Nr. 3993, 1905.	Royal Observatory.
34	Letter from Director, 1897.	*Annales de l'Obs.*, 1885.	Obs., Univ. of Bordeaux.
35	Letter from Director, 1909.	Letter from Director, 1909.	Boston Univ. Obs., since 1908.
36	Letter from Director, 1895.	Letter from Director, 1895.	Boston Univ. Obs., before 1908.
37	*Beob. zu Bothkamp*, 1872.	Letter from Director, 1913.	Obs. of Herr von Bülow.
38	*Astron. Nach.*, Nr. 15, 1822.	*Astron. Nach.*, Nr. 15, 1822.	Formerly Olber's Obs.
39	Letter from Director, 1897.	*Astron. Nach.*, Nr. 3993, 1905.	Royal University Obs.
40	British *Nautical Almanac.*	[e] British *Nautical Almanac.*	Brisbane Observatory.
41	Letter from Director, 1913.	Letter from Director, 1913.	Royal Obs., since 1891.
42	*Annales de l'Obs.*, 1857.	Letter from Director, 1913.	Royal Obs., before 1891.
43	*Astron. Nach.*, Nr. 2752, 1886.	*Astron. Nach.*, Nr. 2752, 1886.	University Observatory.
44	Letter from Director, 1879.	Letter from Director, 1879.	University Observatory.
45	*Harvard Annals*, 1887.	*U. S. C. and G. S. Report*, 1897.	Harvard College Obs.
46	*Cape Gen. Catalogue of Stars*, 1885.	*Monthly Notices, R. A. S.*, Nov. 1908.	Royal Observatory.
47	See footnote ([d]).	Letter from Director, 1913.	International Lat. Obs.
48	Letter from Director, 1913.	Letter from Director, 1913.	Royal Obs. of Catania and Etna.
49	*Annales de l'Obs.*, 1904.	*Annales de l'Obs.*, 1904.	University Observatory.
50	Letter from Director, 1913.	Letter from Director, 1913.	Leander McCormick Obs., Univ. Va.

[a] Name of Western Univ. of Pa. changed in 1908; now the Univ. of Pittsburgh.

[b] *Professional Papers, Corps of Engineers, U. S. A.*, 1882.

[c] Old meridian circle 0″.4 S., $0^s.1$ W. of Cercle Syngros.

[d] *Resultate des Internationalen Breitendienstes*, 1900–1908.

[e] With the new value of the longitude of Sydney.

No.	Place.	Latitude.	Reduction to Geocentric Latitude.	Altitude (*Meters*).	Log ρ (*Including altitude*).	Longitude from Greenwich.	Reduction from Greenwich to Local S.T.M.N.
		° ′ ″	′ ″			h m s	s
51	Chicago, Ill.	+41 50 1.0	−11 31.2	. . .	9.999352	+5 50 26.84	+57.57
52	Christiania, Norway .	+59 54 44.0[a]	−10 4.6	25[a]	9.998908	−0 42 53.50[a]	− 7.05
53	Cincinnati, Ohio . . .	+39 8 19.8[b]	−11 20.7	247[b]	9.999437	+5 37 41.40[b]	+55.48
54	Cincinnati, Ohio . . .	+39 6 26.5	−11 20.5	. . .	9.999421	+5 37 59.00	+55.52
55	Cleveland, Ohio . . .	+41 30 14.5[c]	−11 30.2	215[c]	9.999375	+5 26 25.86[c]	+53.62
56	Clinton, N. Y. . . .	+43 3 17.0	−11 33.9	276	9.999340	+5 1 37.45	+49.55
57	Coimbra, Portugal . .	+40 12 24.5	−11 25.6	99	9.999400	+0 33 43.1	+ 5.54
58	Columbia, Mo. . . .	+38 56 51.7[d]	−11 19.7	225[e]	9.999440	+6 9 18.33[d]	+60.67
59	Columbus, Ohio . . .	+39 59 50.4[d]	−11 24.7	233[d]	9.999414	+5 32 2.60[d]	+54.55
60	Copenhagen, Denmark .	+55 41 12.6	−10 48.6	14	9.999005	−0 50 18.69[f]	− 8.26
61	Cordova, Arg. Rep. . .	−31 25 15.5[g]	+10 18.0	434[g]	9.999634	+4 16 48.22[g]	+42.19
62	Cracow, Austria . . .	+50 3 52 0[a]	−11 25.2	221[a]	9.999157	−1 19 50.27[a]	−13.12
63	Danzig, Prussia . . .	+54 21 18.0	−10 59.6	3	9.999036	−1 14 39.6	−12.26
64	Dehra Dun, India . .	+30 18 51.8[h]	−10 5.3	681[h]	9.999676	−5 12 11.76[h]	−51.29
65	Denver, Colo. . . .	+39 40 36.4[a]	−11 23.3	1644[i]	9.999518	+6 59 47.72[a]	+68.96
66	Des Moines, Iowa . .	+41 36 0	−11 30.5	296	9.999378	+6 14 30.56	+61.52
67	Dorpat (Jurjew), Russia	+58 22 47.2[a]	−10 22.1	67[a]	9.998945	−1 46 53.22[a]	−17.56
68	Dresden, Saxony . .	+51 2 16.8	−11 20.8	121	9.999126	−0 54 54.74	− 9.02
69	Dublin, Ireland . . .	+53 23 13.1[a]	−11 6.7	86[a]	9.999066	+0 25 21.1[a]	+ 4.16
70	Dun Echt, Scotland .	+57 9 36	−10 34.8	141	9.998979	+0 9 40.0	+ 1.59
71	Durham, England . .	+54 46 6.2[j]	−10 56.4	107[k]	9.999033	+0 6 19.75[j]	+ 1.04
72	Dusseldorf, Prussia . .	+51 12 25.0[l]	−11 19.9	46[l]	9.999117	−0 27 2.69[l]	− 4.44
73	Edinburgh, Scotland .	+55 55 30.0[a]	−10 46.5	134[m]	9.999007	+0 12 44.22[a]	+ 2.09
74	Edinburgh, Scotland .	+55 57 23.2[n]	−10 46.2	106[o]	9.998995	+0 12 43.05[n]	+ 2.09
75	Elmira, N. Y. . . .	+42 6 25	−11 31.9	. . .	9.999345	+5 7 13.90	+50.47
76	Evanston, Ill.. . . .	+42 3 33.4	−11 31.8	175	9.999358	+5 50 42.3	+57.61
77	Flagstaff, Ariz. . . .	+35 12 30.5	−10 54.7	2210	9.999667	+7 26 44.58	+73.39
78	Gaithersburg, Md. . .	+39 8 13.2[r]	−11 20.7	165	9.999431	+5 8 47.73	+50.73
79	Geneva, N. Y. . . .	+42 52 46.2	−11 33.6	152	9.999336	+5 8 1.00	+50.60
80	Geneva, Switzerland .	+46 11 59.3[a]	−11 35.2	407[a]	9.999268	−0 24 36.61[a]	− 4.04
81	Genoa, Italy	+44 25 9.3[a]	−11 35.5	105	9.999293	−0 35 41.28[a]	− 5.86
82	Georgetown, D. C. . .	+38 54 26.7[b]	−11 19.5	47	9.999429	+5 8 18.26[b]	+50.65
83	Glasgow, Mo.	+39 13 45.6	−11 21.1	227	9.999433	+6 11 18.08	+61.00
84	Glasgow, Scotland . .	+55 52 42.8[a]	−10 46.9	55[p]	9.999003	+0 17 10.55[a]	+ 2.82
85	Gotha, Germany . . .	+50 56 37.9[l]	−11 21.2	322[a]	9.999142	−0 42 50.51[l]	− 7.04
86	Gotha, Germany . . .	+50 56 4.4[j]	−11 21.2	360[j]	9.999145	−0 42 55.09[j]	− 7.05
87	Göttingen, Prussia . .	+51 31 48.1[q]	−11 18.2	161[q]	9.999116	−0 39 46.22[q]	− 6.53
88	Greencastle, Ind. . .	+39 38 46.6[a]	−11 23.1	262[a]	9.999425	+5 47 24.36[a]	+57.07
89	Greenwich, England .	+51 28 38.2[a]	−11 18.5	49[a]	9.999110	0 0 0.00[a]	0.00
90	Hamburg, Germany .	+53 33 6.0	−11 5.6	25	9.999057	−0 39 53.60[a]	− 6.55
91	Hamburg, Germany .	+53 32 51.3[d]	−11 5.6	30[d]	9.999058	−0 39 53.46[d]	− 6.55
92	Hanover, N. H. . . .	+43 42 15.3	−11 34.8	183	9.999317	+4 49 8.02	+47.50
93	Haverford, Pa. . . .	+40 0 40.1[r]	−11 24.8	. . .	9.999398	+5 1 12.70[r]	+49.48
94	Heidelberg, Baden . .	+49 23 55.2[s]	−11 27.8	567[s]	9.999198	−0 34 53.13[s]	− 5.73
95	Heidelberg, Baden . .	+49 23 55.7[t]	−11 27.8	570[t]	9.999198	−0 34 52.96[t]	− 5.73
96	Heidelberg, Baden . .	+49 24 34.3[l]	−11 27.8	126[l]	9.999168	−0 34 46.80[l]	− 5.71
97	Helsingfors, Finland .	+60 9 42.3[a]	−10 1.5	33[a]	9.998903	−1 39 49.10[a]	−16.40
98	Herény, Hungary . .	+47 15 47.4	−11 33.7	229	9.999229	−1 6 24.7	−10.91
99	Hong Kong, China . .	+22 18 13.2[j]	− 8 7.4	33[j]	9.999793	−7 36 41.86[j]	−75.01
100	Iowa City, Iowa . . .	+41 40 0	−11 30.7	183	9.999369	+6 6 6	+60.14

[a] Meridian circle.
[b] Center of dome.
[c] Zenith telescope pier.
[d] Transit pier.
[e] Observatory bench mark.
[f] Center of observatory.
[g] Old meridian circle.
[h] Floor-level of zenith sector pillar.
[i] Main floor.
[j] Transit instrument.
[k] Barometer in transit room.
[l] Equatorial.
[m] Standard barometer.
[n] Point midway between transit instrument and mural circle.
[o] Floor of main building.
[p] Floor of meridian circle room.
[q] Position of meridian circle before 1888.
[r] Zenith telescope.
[s] Repsold meridian circle.
[t] Bruce telescope.

No.	Authority for—		Description.
	Latitude.	Longitude.	
51	U. S. Lake Survey, 1864.	Smithsonian *Report*, 1886.	[a] Dearborn Observatory.
52	*Astron. Nach.*, Nr. 3193, 1893.	*Astron. Nach.*, Nr. 3993, 1905.	University Observatory.
53	*Publications* of the Obs., 1908.	*Astronomical Journal*, 1897.	Cincinnati Obs., since 1873.
54	Letter from Director, 1897.	*Astronomical Journal*, 1854.	Cincinnati Obs. before 1873.
55	Letter from Director, 1913.	Letter from Director, 1913.	Case Obs., Case School of Appl'd Sci.
56	*Astron. Nach.*, Nr. 2553, 1883.	*Astron. Nach.*, Nr. 2553, 1883.	Litchfield Obs., Hamilton College.
57	*Eph. Astron. de Coimbra*, 1889.	*Eph. Astron. de Coimbra*, 1889.	University Observatory.
58	*Trans. Acad. of Sci. of St. Louis*, 1894.	*Trans. Acad. of Sci. of St. Louis*, 1894.	Laws Obs., Univ. of Mo.
59	Letter from Director, 1913.	Letter from Director, 1899.	McMillin Obs., State Univ.
60	British *Nautical Almanac*.	*Astron. Nach.*, Nr. 3993, 1905.	University Observatory.
61	*Resultados del Obs.*, 1887.	*Resultados del Obs.*, 1887.	National Observatory.
62	Letter from Director, 1913.	Letter from Director, 1913.	Imperial and Royal Obs.
63	Letter from Director, 1897.	Letter from Director, 1897.	Obs. of the School of Navigation.
64	*Great Trig. Survey of India*, 1906.	Letter from Supt. of Survey, 1913.	Haig Obs., Trig. Survey of India.
65	Letter from Director, 1913.	Letter from Director, 1913.	Chamberlin Obs., Univ. of Denver.
66	*Les Obs. Astron.*, Bruxelles, 1907.	*Les Obs. Astron.*, Bruxelles, 1907.	Drake Univ. Obs.
67	*Publikationen der Sternw.*, 1911.	*Astron. Nach.*, Nr. 3993, 1905.	Imperial University Obs.
68	*Berliner Jahrbuch.*	*Berliner Jahrbuch.*	[b] Baron Engelhardt's Obs.
69	*Trans. Royal Dublin Soc.*, 1889.	*Trans. Royal Irish Acad.*, 1838.	Dunsink Obs., Trinity College.
70	Letter from Royal Astronomer, 1897.	Letter from Royal Astronomer, 1897.	[c] Lord Crawford's Obs.
71	Letter from Director, 1913.	Letter from Director, 1913.	University Observatory.
72	*Astron. Nach.*, Nr. 643, 1848.	Letter from Director, 1913.	Municipal Obs., Bilk.
73	*Monthly Notices, R. A. S.*, 1907.	Letter from Director, 1913.	Royal Obs. since 1895; Blackford Hill.
74	*Monthly Notices, R. A. S.*, 1836.	*Edinburgh Observations*, 1858.	[d] Royal Obs. before 1895; Calton Hill.
75	Letter from Director, 1912.	Letter from Director, 1912.	Elmira College Obs.
76	Letter from Director, 1893.	Letter from Director, 1893.	Dearborn Obs., North Western Univ.
77	British *Nautical Almanac*.	British *Nautical Almanac*.	Lowell Observatory.
78	See footnote ([j]).	See footnote ([k]).	International Lat. Obs.
79	*Les Obs. Astron.*, Bruxelles, 1907.	*Les Obs. Astron.*, Bruxelles, 1907.	Smith Observatory.
80	*Memoire* par J. Pidoux, 1900.	*Astron. Nach.*, Nr. 3993, 1905.	Municipal Observatory.
81	Letter from Director, 1897.	*Astron. Nach.*, Nr. 3993, 1905.	Hydrographic Institute.
82	See footnote ([e]).	See footnote ([e]).	Georgetown College Obs.
83	*Astron. Nach.*, Nr. 2625, 1884.	*Washington Observations*, 1877.	Morrison Observatory.
84	*First Glasgow Catalogue*, 1870.	*Monthly Notices, R. A. S.*, 1865.	University Observatory.
85	Letter from Director, 1913.	Letter from Director, 1913.	Ducal Obs. since 1857.
86	Letter, Director new Obs., 1913.	Letter, Director new Obs., 1913.	Ducal Obs. before 1857.
87	*Astron. Nach.*, Nr. 4428, 1910.	*Astron. Nach.*, Nr. 3993, 1905.	Royal University Obs.
88	Letter from Director, 1912.	Letter from Director, 1912.	McKim Obs., De Pauw Univ.
89	*Greenwich Observations*, 1910.	*Greenwich Observations*, 1910.	[f] Royal Observatory.
90	Letter, Director new Obs., 1913.	*Astron. Nach.*, Nr. 3993, 1905.	[g] Hamburg Observatory before 1909.
91	Letter from Director, 1913.	Letter from Director, 1913.	[h] Imperial Marine Obs.
92	Letter from Director, 1894.	Letter from Director, 1894.	Shattuck Obs., Dartmouth College.
93	*Proc. Amer. Ph. Soc.*, 1883.	*Proc. Amer. Ph. Soc.*, 1883.	Haverford College Obs.
94	Letter from Director, 1913.	Letter from Director, 1913.	Astron. Institute, Königstuhl Obs.
95	*Publik. des Obs., Königstuhl*, 1902.	*Publik. des Obs., Königstuhl*, 1902.	Astrophys. Inst., Königstuhl Obs.
96	*Publik. des Obs., Königstuhl*, 1902.	*Publik. des Obs., Königstuhl*, 1902.	[i] Dr. Wolf's Obs. before 1898.
97	Letter from Director, 1913.	*Astron. Nach.*, Nr. 3993, 1905.	Imperial Univ. Obs.
98	*Astron. Nach.*, Nr. 2633, 1884.	British *Nautical Almanac*.	Astrophysical Observatory.
99	*Hong Kong Observations*, 1897.	Letter from Director, 1897.	Colonial Observatory.
00	*Les Obs. Astron.*, Bruxelles, 1907.	*Les Obs. Astron.*, Bruxelles, 1907.	Obs., Univ. of Iowa.

[a] Transferred to Evanston, Ill., in 1887.
[b] Instruments transferred to Univ. of Kasan in 1897.
[c] Instruments transferred to Royal Obs. at Edinburgh in 1896.
[d] City Obs. since 1896.
[e] Based upon data from the U. S. C. and G. Survey.
[f] Point of reference before 1851, 7½ ft. N., 19 ft. W.
[g] At Bergedorf since 1909.
[h] Transit instrument before 1908, $0''.5$ N., $0^{s}.04$ W.
[i] Instruments transferred to the Astrophysical Institute of the Königstuhl Obs. in 1898.
[j] *Resultate des Internationalen Breitendienstes*, 1900–1908.
[k] *Resultate des Internationalen Breitendienstes*, Band I, 1903.

No.	Place.	Latitude.	Reduction to Geocentric Latitude.	Altitude (*Meters*).	Log ρ (*Including altitude*).	Longitude from Greenwich.	Reduction from Greenwich to Local S.T.M.N.
		° ′ ″	′ ″			h m s	s
101	Ithaca, N. Y. . . .	+42 26 47.3 a	−11 32.6	256 a	9.999354	+5 5 55.99 a	+50.26
102	Ithaca, N. Y. . . .	+42 26 51.4	−11 32.6	. . .	9.999337	+5 5 56.47	+50.26
103	Jamaica, West Indies .	+18 24 51 b	− 6 55.9	540 b	9.999892	+5 11 29.48 b	+51.17
104	Jena, Saxe-Weimar . .	+50 55 34.9 c	−11 21.3	165 c	9.999132	−0 46 20.22 c	− 7.61
105	Jena, Saxe-Weimar . .	+50 55 35.8	−11 21.3	155	9.999131	−0 46 20.31	− 7.61
106	Jena, Saxe-Weimar . .	+50 56 11.0	−11 21.3	174	9.999132	−0 46 20.73	− 7.61
107	Johannesburg, Transvaal	−26 10 54.6 d	+ 9 9.8	1804 d	9.999840	−1 52 18.0 d	−18.45
108	Kalocsa, Hungary . .	+46 31 41.7 b	−11 34.8	117 e	9.999240	−1 15 54.12 b	−12.47
109	Kasan, Russia . . .	+55 50 20.0 f	−10 47.3	98 f	9.999007	−3 15 15.61 f	−32.08
110	Kasan, Russia. . . .	+55 47 23.9 g	−10 47.7	79 g	9.999007	−3 16 29.00 g	−32.28
111	Kew, England . . .	+51 28 6	−11 18.5	10	9.999108	+0 1 15.1	+ 0.21
112	Kief, Russia	+50 27 10.0 w	−11 23.5	179 f	9.999145	−2 2 0.56 f	−20.04
113	Kiel, Prussia	+54 20 27.6 f	−10 59.7	52 f	9.999040	−0 40 35.45 f	− 6.67
114	Kis-Kartal, Hungary .	+47 41 54.8	−11 32.8	. . .	9.999202	−1 18 11.7	−12.85
115	Königsberg, Prussia .	+54 42 50.5 f	−10 56.8	24 f	9.999029	−1 21 58.97 f	−13.47
116	Kremsmunster, Austria	+48 3 23.1 f	−11 32.0	384 f	9.999220	−0 56 31.58 f	− 9.29
117	La Plata, Arg. Rep. .	−34 54 31.8 h	+10 52.2	18 h	9.999525	+3 51 44.8 h	+38.07
118	Leiden, Netherlands .	+52 9 19.8 f	−11 14.6	6 f	9.999090	−0 17 56.15 f	− 2.95
119	Leipzig, Saxony . . .	+51 20 5.9 i	−11 19.2	119 i	9.999118	−0 49 33.92 i	− 8.14
120	Leipzig, Saxony . . .	+51 20 20.1	−11 19.2	. . .	9.999110	−0 49 29.92	− 8.13
121	Liege, Belgium . . .	+50 37 6	−11 22.8	127	9.999137	−0 22 15.44	− 3.66
122	Lisbon (Tapada), Portugal	+38 42 30.5 j	−11 18.5	95 j	9.999437	+0 36 44.68 j	+ 6.04
123	Liverpool, England . .	+53 24 4.8	−11 6.6	61	9.999064	+0 12 17.33	+ 2.02
124	Liverpool, England . .	+53 24 47.8	−11 6.5	. . .	9.999059	+0 12 0.11	+ 1.97
125	Lund, Sweden . . .	+55 41 51.6 i	−10 48.5	38	9.999006	−0 52 44.97 i	− 8.67
126	Lund, Sweden . . .	+55 52 12.0	−10 47.0	. . .	9.999000	−0 52 47.50	− 8.67
127	Lussinpiccolo, Austria .	+44 32 11.0	−11 35.5	42	9.999286	−0 57 52.41	− 9.51
128	Lyons, France . . .	+45 41 41.0	−11 35.5	299	9.999274	−0 19 8.52 k	− 3.14
129	Madison, Wis. . . .	+43 4 36.8 f	−11 33.9	292 l	9.999340	+5 57 37.90 f	+58.75
130	Madras, India . . .	+13 4 8.0 f	− 5 5.5	7	9.999926	−5 20 59.14	−52.73
131	Madrid, Spain . . .	+40 24 30.0 m	−11 26.4	655 m	9.999433	+0 14 45.09 m	+ 2.42
132	Manila, P. I.	+14 34 41	− 5 38.2	3	9.999908	−8 3 54.2	−79.48
133	Mare Island, Cal. . .	+38 5 55.8 n	−11 15.0	18 n	9.999447	+8 9 5.63 n	+80.35
134	Markree, Ireland . .	+54 10 31.8	−11 1.0	45	9.999044	+0 33 48.4	+ 5.55
135	Marseilles, France . .	+43 18 19 f	−11 34.3	75 o	9.999320	−0 21 34.55 f	− 3.54
136	Marseilles, France . .	+43 17 52	−11 34.3	27	9.999317	−0 21 28.1	− 3.53
137	Mauritius (Port Louis) .	−20 5 39	+ 7 27.7	54	9.999832	−3 50 12.6	−37.82
138	Melbourne, Victoria .	−37 49 53.2 p	+11 13.4	28 q	9.999454	−9 39 53.92 p	−95.26
139	Meudon, France . . .	+48 48 18	−11 29.8	162	9.999185	−0 8 55.6	− 1.47
140	Middletown, Conn. . .	+41 33 16.0	−11 30.4	. . .	9.999359	+4 50 37.18	+47.74
141	Milan, Italy	+45 27 59.2	−11 35.6	120	9.999268	−0 36 45.88 g	− 6.04
142	Minneapolis, Minn. . .	+44 58 40.0 r	−11 35.7	260 r	9.999290	+6 12 56.84 r	+61.27
143	Mizusawa, Japan . .	+39 8 3.6 x	−11 20.7	62	9.999424	−9 24 30.75	−92.74
144	Modena, Italy . . .	+44 38 51.4	−11 35.6	64	9.999285	−0 43 43.40	− 7.15
145	Montreal, Canada . .	+45 30 20 s	−11 35.6	57 s	9.999262	+4 54 18.63 s	+48.35
146	Moscow (Presnia), Russia	+55 45 19.5	−10 48.0	150 f	9.999012	−2 30 17.03 f	−24.69
147	Mount Hamilton, Cal. .	+37 20 25.6 r	−11 10.4	1284 r	9.999552	+8 6 34.89 r	+79.93
148	Mount Wilson, Cal. . .	+34 12 59.5 t	−10 46.2	1799 t	9.999663	+7 52 14.33 t	+77.56
149	Mount Wilson, Cal. . .	+34 12 55	−10 46.1	1727 u	9.999658	+7 52 14.3	+77.56
150	Munich, Bavaria . .	+48 8 45.5 v	−11 31.7	529 v	9.999227	−0 46 26.02 v	− 7.63

a Top of east pier in transit room.
b Transit instrument pier.
c Bamberg equatorial.
d International latitude hut.
e Seven-inch equatorial.
f Meridian circle.
g Center of great dome.
h Gautier meridian circle.
i Center of observatory.
j Center of dome.
k Pier of small meridian circle.
l Main floor.
m Center of rotunda.
n East transit instrument.
o Barometer.
p Old meridian circle.
q Floor of meridian room.
r Transit instrument.
s East transit pier.
t Snow telescope pier.
u Floor.
v West dome.
w Photographic equatorial, 41 feet south of prime vertical transit.
x Zenith telescope.

No.	Authority for— Latitude.	Authority for— Longitude.	Description.
101	Letter from the Dean, 1913.	Letter from the Dean, 1913.	[a] Fuertes Obs., Cornell Univ.
102	Letter from the Dean, 1913.	Letter from the Dean, 1913.	[b] Fuertes Obs., Cornell Univ.
103	*Memoirs, R. A. S.*, 1879.	See footnote ([c]).	Mr. Hall's Obs., Montego Bay.
104	Letter from Director, 1913.	Letter from Director, 1913.	Univ. Obs., since 1888.
105	Letter, Director new Obs., 1913.	Letter, Director new Obs., 1913.	Univ. Obs., before 1888.
106	*V. J. S. Astron. Gesell.*, 1910.	*V. J. S. Astron. Gesell.*, 1910.	The late Dr. Winkler's Obs.
107	Transvaal Obs. *Circular*, 1910.	Transvaal Obs. *Circular*, 1910.	Union Obs., formerly Transvaal Obs.
108	Letter from Director, 1913.	Letter from Director, 1913.	Archiepiscopal Haynald Obs.
109	Letter from Director, 1913.	Publications of the Obs., 1911.	Engelhardt Obs., Univ. of Kasan.
110	Publications of the Obs., 1911.	Letter from Director, 1913.	University Observatory.
111	Letter from Director, 1897.	Letter from Director, 1897.	Meteorological Obs., London.
112	*Annales de l' Obs.*, Vol. IV, 1893.	*Astron. Nach.*, Nr. 3993, 1905.	Imperial Univ. Obs.
113	*Les Obs. Astron.*, Bruxelles, 1907.	*Astron. Nach.*, Nr. 3993, 1905.	[d] Royal University Obs.
114	*Les Obs. Astron.*, Bruxelles, 1907.	*Les Obs. Astron.*, Bruxelles, 1907.	Near Aszòd, Hungary.
115	Letter from Director, 1913.	*Astron. Nach.*, Nr. 3993, 1905.	Royal University Obs.
116	Letter from Director, 1897.	*Astron. Nach.*, Nr. 3993, 1905.	Obs. of the Benedictines.
117	Letter from Director, 1913.	Letter from Director, 1913.	National Univ. Obs.
118	Letter from Director, 1913.	*Astron. Nach.*, Nr. 3993, 1905.	University Observatory.
119	Letter from Director, 1913.	*Astron. Nach.*, Nr. 3993, 1905.	University Obs., since 1861.
120	Letter, Director new Obs., 1913.	Letter, Director new Obs., 1913.	University Obs., before 1861.
121	*Les Obs. Astron.*, Bruxelles, 1907.	*Les Obs. Astron.*, Bruxelles, 1907.	University Obs., Cointe.
122	Letter from Director, 1913.	*Astron. Nach.*, Nr. 3202, 1893.	Obs. of Lisbon.
123	*Monthly Notices, R. A. S.*, 1894.	*Monthly Notices, R. A. S.*, 1894.	Bidston, Birkenhead, since 1867.
124	British *Nautical Almanac*, 1872.	British *Nautical Almanac*, 1872.	Liverpool Obs., before 1867.
125	Letter from Director, 1913.	*Astron. Nach.*, Nr. 3993, 1905.	Royal Univ. Obs., since 1867.
126	Letter, Director new Obs., 1913.	Letter, Director new Obs., 1913.	Royal Univ. Obs., before 1867.
127	Letter from Director, 1897.	Letter from Director, 1897.	Manora Observatory.
128	Letter from Director, 1897.	*Astron. Nach.*, Nr. 3202, 1893.	Obs. of the Univ., St. Genis Laval.
129	*Publications* of the Obs., 1892.	Letter from Director, 1912.	Washburn Obs., Univ. of Wis.
130	*Great Trig. Survey of India*, 1906.	*Great Trig. Survey of India*, 1901.	Obs. founded by East India Co.
131	*Annuario del Obs.*, 1912.	*Astron. Nach.*, Nr. 3993, 1905.	Astron. and Meteorolog. Obs.
132	*Les Obs. Astron.*, Bruxelles, 1907.	*Les Obs. Astron.*, Bruxelles, 1907.	Meteorological Observatory.
133	Letter from Director, 1913.	*Lick Obs. Bulletin*, 1908.	Chronom. and Time Sta., Navy Yd.
134	*Astron. Nach.* Nr. 758, 1851.	British *Nautical Almanac*, 1901.	Col. Cooper's Observatory.
135	Letter from Director, 1913.	*Astron. Nach.* Nr. 3993, 1905.	See footnote ([e]).
136	Letter, Director new Obs., 1913.	Letter, Director new Obs., 1913.	See footnote ([f]).
137	Mag. and Meteor. *Results*, 1908.	Mag. and Meteor. *Results*, 1908.	Royal Alfred Obs.
138	*Astron. Results*, 1881–84.	[i] *Astron Results*, 1881–84.	[g] Government Observatory.
139	*Les Obs. Astron.*, Bruxelles, 1907.	*Les Obs. Astron.*, Bruxelles, 1907.	Seine-et-Oise, near Paris.
140	Letter from Director, 1894.	Letter from Director, 1894.	Wesleyan University Obs.
141	British *Nautical Almanac*.	*Astron. Nach.*, Nr. 3993, 1905.	Royal Observatory, Brera.
142	Letter from Director, 1913.	Letter from Director, 1913.	Obs. Univ. of Minn.
143	See footnote ([h]).	*Les Obs. Astron.*, Bruxelles, 1907.	International Lat. Obs.
144	Letter from Director, 1913.	Letter from Director, 1913.	Royal Univ. Geophysical Obs.
145	Letter from Director, 1912.	*U. S. C. and G. S. Report*, 1897.	McGill University Obs.
146	*Les Obs. Astron.*, Bruxelles, 1907.	*Astron. Nach.*, Nr. 3993, 1905.	Obs. of the Imperial Univ.
147	*Publications* of the Obs. 1900.	*U. S. C. and G. S. Report*, 1897.	Lick Obs., Univ. of Cal.
148	*Astrophysical Journal*, 1906.	*Astrophysical Journal*, 1906.	Solar Obs., Carnegie Inst.
149	Letter from C. G. Abbot, 1912.	Letter from C. G. Abbot, 1912.	Branch of Smithson. Astrophys. Obs.
150	Letter from Director, 1897.	*Astron. Nach.*, Nr. 3993, 1905.	Royal Observatory.

[a] Since 1902.
[b] Before 1902.
[c] *British Report on Transit of Venus*, 1882.
[d] Old position of meridian circle, $0''.9$ N., $0^{s}.12$ E.
[e] National Obs., Univ. of Aix-Marseilles, since 1864–66.
[f] National Obs., at Accoules, before 1864–66.
[g] Transferred from Williamstown in 1861.
[h] *Resultate des Internationalen Breitendienstes*, 1900–1908.
[i] With the new values of the longitudes of Adelaide and Sydney.

No.	Place.	Latitude.	Reduction to Geocentric Latitude.	Altitude (*Meters*).	Log ρ (*Including altitude*).	Longitude from Greenwich.	Reduction from Greenwich to Local S.T.M.N.
		° ′ ″	′ ″			h m s	s
151	Naples, Italy	+40 51 46.3	−11 28.1	164	9.999388	−0 57 1.70 [a]	− 9.37
152	Nashville, Tenn. . .	+36 8 54.4 [b]	−11 2.0	172 [c]	9.999505	+5 47 12.2	+57.04
153	Neuchâtel, Switzerland	+46 59 50.6	−11 34.1	488	9.999254	−0 27 49.90 [d]	− 4.57
154	New Brunswick, N. J. .	+40 30 1.4 [b]	−11 26.7	21 [b]	9.999387	+4 57 47.45 [b]	+48.92
155	New Haven, Conn. . .	+41 19 22.3	−11 29.6	40	9.999368	+4 51 40.58	+47.92
156	New Haven, Conn. . .	+41 18 36.5	−11 29.6	. . .	9.999365	+4 51 42.16	+47.92
157	New York, N. Y. . .	+40 48 34.6	−11 27.9	25	9.999380	+4 55 50	+48.60
158	New York, N. Y. . .	+40 45 23.1	−11 27.7	. . .	9.999379	+4 55 53.64	+48.61
159	Nice, France	+43 43 16.9 [e]	−11 34.9	378	9.999330	−0 29 12.15 [e]	− 4.80
160	Nikolaieff, Russia . .	+46 58 22.1	−11 34.2	55	9.999225	−2 7 53.78 [a]	−21.01
161	Northampton, Mass. .	+42 19 1.9 [b]	−11 32.4	70 [b]	9.999345	+4 50 33.10 [b]	+47.73
162	Northfield, Minn. . .	+44 27 41.6 [f]	−11 35.5	290 [f]	9.999305	+6 12 35.92 [f]	+61.21
163	Oakland, Cal. . . .	+37 48 5 [d]	−11 13.2	11 [d]	9.999454	+8 9 6.55 [d]	+80.35
164	Odessa, Russia . . .	+46 28 37.5	−11 34.9	. . .	9.999234	−2 3 2.18 [b]	−20.21
165	Odessa, Russia . . .	+46 28 36.7 [d]	−11 34.9	55 [d]	9.999237	−2 3 2.04 [d]	−20.21
166	O-Gyalla, Hungary . .	+47 52 27.3	−11 32.4	113	9.999206	−1 12 45.49	−11.95
167	Omaha, Nebr. . . .	+41 16 5.6 [b]	−11 29.5	344 [b]	9.999390	+6 23 46.96 [b]	+63.05
168	Orono, Me.	+44 54 0	−11 35.6	38	9.999277	+4 34 40.3	+45.12
169	Ottawa, Canada . . .	+45 23 39.1 [d]	−11 35.6	85 [g]	9.999267	+5 2 51.98 [d]	+49.75
170	Oxford, Miss.	+34 22 12.6	−10 47.5	. . .	9.999536	+5 58 7.18	+58.83
171	Oxford, England . .	+51 45 35.6 [d]	−11 16.9	65 [h]	9.999104	+0 5 2.6	+ 0.83
172	Oxford, England . .	+51 45 34.2	−11 16.9	64	9.999104	+0 5 0.40	+ 0.82
173	Padua, Italy	+45 24 1.0 [i]	−11 35.6	31 [j]	9.999263	−0 47 29.13 [i]	− 7.80
174	Palermo, Sicily . . .	+38 6 44.0 [k]	−11 15.1	76 [d]	9.999451	−0 53 25.87	− 8.73
175	Paris, France	+48 50 11.2 [l]	−11 29.8	67 [m]	9.999178	−0 9 20.93 [n]	− 1.53
176	Perth, West Australia .	−31 57 8.9 [d]	+10 23.8	60	9.999597	−7 43 21.51 [d]	−76.12
177	Philadelphia, Pa. . .	+39 58 2.1 [o]	−11 24.6	74 [o]	9.999404	+5 1 6.81 [o]	+49.46
178	Pola, Austria	+44 51 48.6 [d]	−11 35.6	32 [d]	9.999277	−0 55 23.07 [d]	− 9.10
179	Potsdam, Prussia . .	+52 22 56.0 [p]	−11 13.3	97 [p]	9.999091	−0 52 15.86 [p]	− 8.59
180	Poughkeepsie, N. Y. .	+41 41 18	−11 30.8	61	9.999360	+4 55 33.6 [b]	+48.55
181	Prague, Bohemia . .	+50 5 16.0 [o]	−11 25.1	197 [o]	9.999155	−0 57 40.28 [o]	− 9.47
182	Princeton, N. J. . . .	+40 20 55.8	−11 26.1	75	9.999395	+4 58 39.44	+49.06
183	Princeton, N. J. . . .	+40 20 57.8 [d]	−11 26.1	65 [d]	9.999394	+4 58 37.61 [d]	+49.06
184	Providence, R. I. . .	+41 50 21	−11 31.2	64	9.999356	+4 45 35.95	+46.92
185	Providence, R. I. . .	+41 49 46.4	−11 31.2	. . .	9.999352	+4 45 37.64	+46.92
186	Pulkowa, Russia . . .	+59 46 18.7 [a]	−10 6.2	75 [q]	9.998914	−2 1 18.57 [a]	−19.93
187	Quebec, Canada . . .	+46 47 59.2	−11 34.4	90	9.999231	+4 44 52.71 [b]	+46.80
188	Quito, Ecuador . . .	− 0 14 0	+ 0 5.6	2908	0.000198	+5 14 6.66	+51.60
189	Riga, Russia	+56 57 9.3	−10 36.9	. . .	9.998974	−1 36 28.10 [r]	−15.85
190	Rio de Janeiro, Brazil .	−22 54 23.8 [o]	+ 8 17.7	62 [o]	9.999784	+2 52 41.4 [o]	+28.37
191	Rome, Italy	+41 53 53.6 [d]	−11 31.3	51 [j]	9.999354	−0 49 55.12 [d]	− 8.20
192	Rome, Italy	+41 53 33.6 [d]	−11 31.3	65 [q]	9.999355	−0 49 56.34 [d]	− 8.20
193	Rome, Italy	+41 54 12.4 [d]	−11 31.4	100 [d]	9.999357	−0 49 48.02 [d]	− 8.18
194	Rome, Italy	+41 54 16.7	−11 31.4	75 [j]	9.999355	−0 49 49.28 [d]	− 8.18
195	San Fernando, Spain .	+36 27 42.0 [s]	−11 4.3	30 [s]	9.999488	+0 24 49.32 [s]	+ 4.06
196	San Fernando, Spain .	+36 31 7	−11 4.7	. . .	9.999485	+0 25 10.82	+ 4.14
197	San Francisco, Cal. .	+37 47 27.9	−11 13.2	. . .	9.999454	+8 9 42.86 [t]	+80.45
198	San Luis, Arg. Rep. .	−33 17 45.7	+10 37.6	800	9.999616	+4 25 22	+43.60
199	Santiago, Chile . . .	−33 26 42 [d]	+10 39.0	520 [d]	9.999594	+4 42 46.0 [d]	+46.45
200	Santiago, Chile . . .	−33 26 25	+10 38.9	619	9.999600	+4 42 36.5	+46.42
201	Santiago, Chile . . .	−33 33 46 [b]	+10 40.1	580 [b]	9.999595	+4 42 46 [b]	+46.45

[a] Center of observatory.
[b] Transit instrument.
[c] Bench mark on obs. steps.
[d] Meridian circle.
[e] Small meridian circle.
[f] Meridian circle pier.
[g] Bench mark in east wall.
[h] Barometer basin.
[i] Axis of tower.
[j] Barometer.
[k] Center of south dome.
[l] South facade of observatory.
[m] Level of obs. terrace.
[n] Cassini's Meridian.
[o] Center of dome.
[p] Center of middle dome.
[q] Main floor.
[r] Tower of school.
[s] Center of building, ground floor.
[t] West transit pier.

No.	Authority for—		Description.
	Latitude.	Longitude.	
151	Letter from Director, 1897.	*Astron. Nach.*, Nr. 3202, 1893.	Royal Obs., Capo di Monte.
152	Letter from the Dean, 1913.	Letter from Director, 1893.	Obs. of Vanderbilt Univ.
153	Swiss Triangulation, 1890.	*Astron. Nach.*, Nr. 3202, 1893.	Cantonal Observatory.
154	Letter from Director, 1913.	Letter from Director, 1913.	SchanckObs.,RutgersCollege.
155	Letter from Director, 1893.	See footnote (h).	Yale Univ. Obs., since 1882.
156	Letter, Director new Obs., 1893.	Letter, Director new Obs., 1893.	Yale Univ. Obs., before 1882.
157	*Contributions from the Obs.*, 1906.	*Contributions from the Obs.*, 1906.	Columbia Univ. Obs., since 1897.
158	Letter from Director, 1879.	British *Nautical Almanac.*	Columbia Univ. Obs., before 1897.
159	*Annales de l'Obs.*, Tome II, 1887.	*Astron. Nach.*, Nr. 3993, 1905.	Mt. Gros, near Nice.
160	*Les Obs. Astron.*, Bruxelles, 1907.	*Astron. Nach.*, Nr. 3202, 1893.	Naval Observatory.
161	Letter from Director, 1913.	Harvard *Annals*, 1893.	Smith College Obs.
162	Letter from Director, 1912.	*Publications* of Obs., 1901.	[a] Goodsell Obs., Carleton College.
163	Letter from Director, 1912.	Letter from Director, 1912.	Chabot Observatory.
164	Pulkowa *Mitteilungen*, No. 56, 1913.	*Astron. Nach.*, Nr. 3993, 1905.	Branch of Pulkowa Obs.
165	Letter from Director, 1897.	*Astron. Nach.*, Nr. 3993, 1905.	University Observatory.
166	Letter from Director, 1897.	Letter from Director, 1897.	Royal Astrophysical Obs.
167	Letter from Director, 1912.	Letter from Director, 1912.	Creighton University Obs.
168	Letter from Director, 1912.	Letter from Director, 1912.	Obs. Univ. of Maine.
169	Letter from Chief Astronomer, 1913.	Letter from Chief Astronomer, 1913.	Dominion Astronomical Obs.
170	Smithsonian *Report*, 1880.	Smithsonian *Report*, 1880.	Obs. Univ. of Mississippi.
171	*Radcliffe Catalogue of Stars*, 1900.	*Radcliffe Observations*, 1842.	Radcliffe Observatory.
172	*Oxford Astron. Observations*, 1878.	*Oxford Astron. Observations*, 1878.	University Observatory.
173	Letter from Director, 1913.	*Astron. Nach.*, Nr. 3993, 1905.	Royal University Obs.
174	Letter from Director, 1913.	*Astron. Nach.*, Nr. 3202, 1893.	Royal Observatory.
175	Letter from Director, 1913.	*Astron. Nach.*, Nr. 3993, 1905.	Observatory of Paris.
176	*Meridian Observations*, Vol. 2, 1908.	[i] *Meridian Observations*, Vol. 2, 1908.	Government Observatory.
177	Letter from Director, 1913.	Letter from Director, 1913.	Flower Obs., Univ. of Pa.
178	Letter from Director, 1913.	Letter from Director, 1913.	See footnote (b).
179	*Veröff. K. Preuss. Geod. Inst.*, 1905.	*Astron. Nach.*, Nr. 3993, 1905.	Royal Astrophysical Obs.
180	Smithsonian *Report*, 1880.	Smithsonian *Report*, 1880.	Vassar College Obs.
181	Prague *Observations*, 1907.	*Astron. Nach.*, Nr. 3993, 1905.	Imperial and Royal Obs.
182	Letter from Director, 1913.	Letter from Director, 1913.	Halsted Obs., Princeton Univ.
183	Letter from Director, 1913.	*Washington Observations*, 1878.	Obs. of Instruction, Princeton Univ.
184	Letter from Director, 1893.	Letter from Director, 1893.	Ladd Obs., Brown Univ.
185	*Astron. Nach.*, Nr. 2254, 1879.	*Astron. Nach.*, Nr. 2254, 1879.	Mr. Seagrave's Observatory.
186	*Description de l'Obs.*, 1845.	*Astron. Nach.*, Nr. 3993, 1905.	Obs. Central Nicolas.
187	Letter from Director, 1912.	Letter from Director, 1912.	Quebec Obs., Plains of Abraham.
188	Letter from Director, 1897.	Letter from Director, 1897.	National Observatory.
189	Letter from Director, 1897.	*Astron. Nach.*, Nr. 3993, 1905.	Polytechnic School Obs.
190	See footnote (c).	See footnote (c).	National Observatory.
191	*Memorie del R. Osserv.*, 1904.	Letter from Director, 1913.	Royal Obs. at Roman College.
192	Letter from Director, 1913.	*Astron. Nach.*, Nr. 3993, 1905.	Royal Univ. Obs. at Capitol.
193	Letter from Director, 1913.	Letter from Director, 1913.	Vatican Obs., since 1906–7.
194	*Pubbl. della Specola Vaticana*, 1905.	*Astron. Nach.*, Nr. 3993, 1905.	[d] Vatican Obs., before 1906–7.
195	*Annales del Obs.*, 1892.	Letter from Director, 1913.	Naval Obs., since 1797.
196	Letter, Director new Obs., 1913.	Letter, Director new Obs., 1913.	[e] Naval Obs., before 1797.
97	Letter from Director, 1897.	*U. S. C. and G. S. Report*, 1897.	Davidson Observatory.
98	Letter from Director, 1911.	Letter from Director, 1911.	Southern Obs. of Carnegie Inst.
99	Letter from Director, 1913.	Letter from Director, 1913.	[f] National Obs., since 1862.
00	Letter, Director new Obs., 1913.	Letter, Director new Obs., 1913.	[g] National Obs., before 1862.
01	Letter from Director, 1913.	Letter from Director, 1913.	National Obs., Espejo.

[a] Old observatory, 1877–1886, 415 feet W.

[b] Observatory of Imperial and Royal Hydrographic Office.

[c] Green and Davis, *Telegraphic Determinations of Longitudes on the East Coast of South America*, 1880.

[d] In the Gregorian tower.

[e] In Cadiz.

[f] In Quinta Normal.

[g] On the hill Santa Lucia, in Santiago.

[h] Based upon data from the U. S. C. and G. Survey.

[i] With the new value of the longitude of Sydney.

No.	Place.	Latitude.	Reduction to Geocentric Latitude.	Altitude (*Meters*).	Log ρ (*Including altitude*).	Longitude from Greenwich.	Reduction from Greenwich to Local S.T.M.N.
		° ′ ″	′ ″			h m s	s
202	South Bethlehem, Pa. .	+40 36 23.2 [a]	−11 27.2	110	9.999391	+ 5 1 31.96 [a]	+ 49.53
203	South Hadley, Mass. .	+42 15 18.2 [b]	−11 32.2	76 [b]	9.999346	+ 4 50 20.40 [b]	+ 47.70
204	St. Louis, Mo. . . .	+38 38 3.0	−11 18.1	. . .	9.999432	+ 6 0 49.26	+ 59.27
205	St. Petersburg, Russia .	+59 56 32.0	−10 4.2	4	9.998906	− 2 1 11.4	− 19.91
206	Stockholm, Sweden .	+59 20 32.6 [c]	−10 11.3	44 [c]	9.998922	− 1 12 13.97 [c]	− 11.87
207	Stonyhurst, England .	+53 50 40	−11 3.4	117 [c]	9.999056	+ 0 9 52.68	+ 1.62
208	Strassburg, Alsace . .	+48 35 0.3 [c]	−11 30.5	144 [c]	9.999190	− 0 31 4.52 [c]	− 5.11
209	Swarthmore, Pa. . .	+39 54 23.3	−11 24.3	. . .	9.999401	+ 5 1 24.89	+ 49.52
210	Sydney, N. S. W. . .	−33 51 41.1	+10 42.9	44	9.999552	−10 4 49.31	− 99.36
211	Syracuse, N. Y. . . .	+43 2 13.1	−11 33.9	160	9.999332	+ 5 4 33.36	+ 50.03
212	Tacubaya, Mexico . .	+19 24 17.5 [c]	− 7 14.8	2285 [c]	9.999995	+ 6 36 46.67 [c]	+ 65.18
213	Tashkent, Turkestan .	+41 19 31.3	−11 29.6	457	9.999396	− 4 37 10.80	− 45.53
214	Taunton, Mass. . . .	+41 54 0	−11 31.3	8	9.999351	+ 4 44 20	+ 46.71
215	Teramo, Italy . . .	+42 39 27 [d]	−11 33.1	398	9.999358	− 0 54 56	− 9.02
216	Tokyo, Japan	+35 39 17.0 [c]	−10 58.3	25	9.999507	− 9 18 58.22 [e]	− 91.82
217	Toronto, Canada . . .	+43 39 46.0 [f]	−11 34.8	110 [g]	9.999313	+ 5 17 34.70 [g]	+ 52.17
218	Toronto, Canada . . .	+43 40 0.8 [g]	−11 34.8	116 [g]	9.999313	+ 5 17 35.60 [g]	+ 52.17
219	Toulouse, France . .	+43 36 44.0	−11 34.7	194	9.999320	− 0 5 51.23	− 0.96
220	Triest, Austria . . .	+45 38 35.5 [h]	−11 35.5	68 [i]	9.999260	− 0 55 5.23 [h]	− 9.05
221	Triest, Austria . . .	+45 38 45.4 [j]	−11 35.5	26 [i]	9.999257	− 0 55 3.0	− 9.04
222	Tschardjui, Turkestan .	+39 8 11.0 [d]	−11 20.7	188 [d]	9.999433	− 4 14 17.2 [d]	− 41.77
223	Tschardjui, Turkestan .	+39 8 10.7 [d]	−11 20.7	167	9.999431	− 4 13 57.3	− 41.72
224	Tulse Hill, England .	+51 26 47	−11 18.6	48	9.999111	+ 0 0 27.7	+ 0.08
225	Turin, Italy	+45 2 16.2 [k]	−11 35.7	618 [k]	9.999313	− 0 31 3 [k]	− 5.10
226	Turin, Italy	+45 4 8.3 [c]	−11 35.7	276 [i]	9.999288	− 0 30 47.15 [c]	− 5.06
227	Tuscaloosa, Ala. . . .	+33 12 36.8 [c]	−10 36.7	69	9.999568	+ 5 50 11.74 [c]	+ 57.53
228	Ukiah, Cal.	+39 8 12.1 [d]	−11 20.7	220 [d]	9.999435	+ 8 12 50.3 [d]	+ 80.96
229	Upsala, Sweden . . .	+59 51 29.4 [b]	−10 5.2	21 [b]	9.998909	− 1 10 30.12 [b]	− 11.58
230	Urbana, Ill.	+40 6 20.2 [l]	−11 25.2	236 [l]	9.999412	+ 5 52 53.90 [l]	+ 57.97
231	Utrecht, Netherlands .	+52 5 9.7 [m]	−11 15.0	12 [m]	9.999093	− 0 20 31.0 [m]	− 3.37
232	Utrecht, Netherlands .	+52 5 13	−11 15.0	23	9.999093	− 0 20 28.9	− 3.36
233	Venice, Italy	+45 26 10.5 [c]	−11 35.6	15 [c]	9.999261	− 0 49 22.12 [c]	− 8.11
234	Vienna, Austria . . .	+48 13 55.1 [n]	−11 31.5	240 [i]	9.999205	− 1 5 21.35 [n]	− 10.74
235	Vienna, Austria . . .	+48 12 35.5	−11 31.6	186 [i]	9.999202	− 1 5 31.61	− 10.76
236	Vienna, Austria . . .	+48 12 53.8	−11 31.6	214	9.999204	− 1 5 25.17	− 10.75
237	Vienna, Austria . . .	+48 12 46.7 [c]	−11 31.6	285	9.999209	− 1 5 10.96	− 10.71
238	Warsaw, Russia . . .	+52 13 4.6 [c]	−11 14.3	121 [c]	9.999097	− 1 24 7.25 [c]	− 13.82
239	Washington, D. C. . .	+38 55 14.0 [o]	−11 19.6	82 [p]	9.999431	+ 5 8 15.78 [o]	+ 50.64
240	Washington, D. C. . .	+38 53 38.7 [q]	−11 19.4	31 [r]	9.999428	+ 5 8 12.15 [q]	+ 50.63
241	Washington, D. C. . .	+38 53 17.3 [s]	−11 19.4	10 [s]	9.999427	+ 5 8 6.24 [s]	+ 50.61
242	Washington, D. C. . .	+38 56 14.8 [a]	−11 19.7	. . .	9.999425	+ 5 8 0.0 [a]	+ 50.60
243	Wellesley, Mass. . . .	+42 17 34.8	−11 32.3	61	9.999344	+ 4 45 12.7	+ 45.85
244	Wellington, N. Z. . .	−41 17 3.8 [b]	+11 29.5	127 [b]	9.999375	−11 39 4.27 [b]	−114.84
245	West Point, N. Y. . .	+41 23 22.1	−11 29.9	170	9.999375	+ 4 55 50.55	+ 48.60
246	Wilhelmshaven, Germany	+53 31 52.1 [c]	−11 5.7	9 [c]	9.999057	− 0 32 35.06 [c]	− 5.35
247	Williams Bay, Wis. .	+42 34 12.6 [t]	−11 33.0	320 [t]	9.999355	+ 5 54 13.24 [t]	+ 58.19
248	Williamstown, Mass. .	+42 42 30	−11 33.2	213	9.999344	+ 4 52 50	+ 48.10
249	Winchester, Mass. . .	+42 27 11	−11 32.7	30	9.999338	+ 4 44 32.4	+ 46.74
250	Windsor, N. S. W. . .	−33 36 30.8 [b]	+10 40.6	16 [r]	9.999556	−10 3 19.9	− 99.11
251	Zô-Sè, China	+31 5 48.0 [c]	−10 14.4	100 [c]	9.999619	− 8 4 44.82 [c]	− 79.63
252	Zurich, Switzerland .	+47 22 38.3 [c]	−11 33.5	469 [c]	9.999243	− 0 34 12.26 [c]	− 5.62

[a] Center of dome.
[b] Transit instrument.
[c] Meridian circle.
[d] Zenith telescope.
[e] Great transit instrument.
[f] Main dome.
[g] Transit pier.
[h] Equatorial pier.
[i] Barometer cistern.
[j] Stone pier in terrace wall.
[k] Prime vertical instrument.
[l] 12-inch equatorial.
[m] Altazimuth pier.
[n] Central dome.
[o] Center of the clock room.
[p] Ground floor of main building.
[q] Small dome.
[r] Barometer.
[s] Siderostat pier.
[t] 40-inch equatorial.

No.	Authority for—		Description.
	Latitude.	Longitude.	
202	Letter from Director, 1913.	*Washington Observations*, 1875.	Sayre Obs., Lehigh Univ.
203	*Amer. Jour. of Sci.*, 1883.	Letter from Director, 1913.	Williston Obs., Mt. Holyoke Coll.
204	Letter from Director, 1897.	*U. S. C. and G. S. Report*, 1897.	[a] Washington University Obs.
205	*Astron. Nach.*, Nr. 2582, 1884.	*Astron. Nach.*, Nr. 2582, 1884.	Imperial University Obs.
206	Letter from Director, 1913.	*Astron. Nach.*, Nr. 3993, 1905.	Obs. of Acad. of Sci.
207	Letter from Director, 1913.	*Monthly Notices, R. A. S.*, 1851.	Stonyhurst College Obs.
208	*Annalen* der Sternw., 1896.	*Astron. Nach.*, Nr. 3993, 1905.	Imperial Univ. Obs.
209	Letter from Director, 1912.	Letter from Director, 1912.	Sproul Obs., Swarthmore College.
210	*Astron. Results*, 1879–81.	See footnote (b).	Government Observatory.
211	Letter from Director, 1891.	Letter from Director, 1891.	Syracuse Univ. Obs.
212	*Annuario del Obs.*, 1902.	*Annuario del Obs.*, 1902.	National Observatory.
213	Letter from Director, 1897.	Letter from Director, 1897.	Tashkent Observatory.
214	*Les Obs. Astron.*, Bruxelles, 1907.	*Les Obs. Astron.*, Bruxelles, 1907.	Mr. Metcalf's Obs., before 1911.
215	*Pubbl. dell'Osserv.*, 1900.	Letter from Director, 1913.	Collurania Observatory.
216	*Annales de l'Obs.*, 1894.	*Annales de l'Obs.*, 1894.	University Observatory.
217	Letter from Director, 1913.	Letter from Director, 1913.	University Observatory.
218	Letter from Director, 1912.	Letter from Director, 1912.	Meteorological Observatory.
219	*Annales de l'Obs.*, 1912.	British *Nautical Almanac.*	University Observatory.
220	Letter from Director, 1913.	Letter from Director, 1913.	[c] Imperial and Royal Maritime Obs.
221	Letter, Director new Obs., 1913.	Letter, Director new Obs., 1913.	[d] Imperial and Royal Maritime Obs.
222	*Astron. Nach.*, Nr. 4588, 1912.	Letter from Director, 1913.	International Lat. Obs., since 1909.
223	See footnote (e).	See footnote (l).	International Lat. Obs., before 1909.
224	British *Nautical Almanac.*	British *Nautical Almanac.*	Obs. of Sir W. Huggins, London.
225	Letter from Director, 1913.	Letter from Director, 1913.	[f] Royal Obs. of the Univ., since 1913.
226	Letter from Director, 1913.	*Astron. Nach.*, Nr. 3993, 1905.	[g] Royal Obs. of the Univ., before 1913.
227	Letter from Director, 1897.	Letter from Director, 1897.	Obs. Univ. of Ala.
228	See footnote (e).	Letter from Director, 1912.	International Lat. Obs.
229	Letter from Director, 1913.	*Astron. Nach.*, Nr. 3993, 1905.	University Observatory.
230	Letter from Director, 1913.	Letter from Director, 1913.	Obs., Univ. of Ill.
231	Letter from Director, 1913.	Letter from Director, 1913.	University Obs., since 1855.
232	Letter, Director New Obs., 1913.	Letter, Director new Obs., 1913.	University Obs., before 1855.
233	Letter from Director, 1913.	Letter from Director, 1913.	Obs. of the Nautical Institute.
234	See footnote (h).	*Astron. Nach.*, Nr. 3993, 1905.	[i] Imperial and Royal Univ. Obs.
235	Letter, Director new Obs., 1913.	Letter, Director new Obs., 1913.	[j] Imperial and Royal Univ. Obs.
236	*Berliner Jahrbuch.*	*Berliner Jahrbuch.*	Oppolzer Obs., Josephstadt.
237	*Publik. der Sternw.*, 1892.	*Astron. Nach.*, Nr. 3993, 1905.	Kuffner Obs., Ottakring.
238	*Astron. Nach.*, Nr. 4666, 1913.	*Astron. Nach.*, Nr. 3993, 1905.	Imperial University Obs.
239	*U. S. Naval Obs. Publications*, 1900.	*U. S. C. and G. S. Report*, 1897.	U. S. N. Obs., Georgetown Heights.
240	See footnote (m).	*U. S. C. and G. S. Report*, 1897.	U. S. Naval Obs., 1842–1893.
241	Letter from Director, 1912.	Letter from Director, 1912.	Smithsonian Astrophysical Obs.
242	*Astronomical Journal*, 1897.	*Astronomical Journal*, 1897.	Catholic Univ. Obs., Brookland.
243	Letter from Director, 1912.	*Les Obs. Astron.*, Bruxelles, 1907.	Whitin Obs., Wellesley College.
244	*New Zealand Gazette*, Feb. 29, 1912.	*New Zealand Gazette*, Feb. 29, 1912.	Hector Observatory.
245	Letter from Director, 1891.	Letter from Director, 1891.	[k] U. S. Military Academy.
246	Letter from Director, 1913.	*Astron. Nach.*, Nr. 3993, 1905.	Imperial Naval Obs.
247	*Astrophysical Journal*, 1901.	*Astrophysical Journal*, 1901.	Yerkes Obs., Univ. of Chicago.
248	Letter from Director, 1893.	Letter from Director, 1893.	Field Memorial Obs., Williams Coll.
249	Letter from Director, 1913.	Letter from Director, 1913.	Mr. Metcalf's Obs., since 1911.
250	*Monthly Notices, R. A. S.*, 1884.	[n] *Monthly Notices, R. A. S.*, 1888.	Mr. John Tebbutt's Obs.
251	*Annales de l'Obs.*, 1907.	*Annales de l'Obs.*, 1907.	Obs. of the Jesuits near Shanghai.
252	Letter from Director, 1913.	*Astron. Nach.*, Nr. 3202, 1893.	Obs. of Swiss Polytechnic School.

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[a] Old observatory 0°.125 E.

[b] Letter from Government Astronomer at Adelaide, 1913.

[c] Since 1898.

[d] Before 1898.

[e] *Resultate des Internationalen Breitendienstes*, 1900–1908.

[f] At Pino Torinese.

[g] At Palazzo Madama.

[h] *Astron. Arbeiten des K. K. Gradmessungs-Bureau*, 1896.

[i] Since 1879.

[j] Before 1879.

[k] Old observatory 9″ N., 1°.2 E.

[l] *Resultate des Internationalen Breitendienstes*, Band I, 1903.

[m] *Washington Observations* for 1892, Appendix I, pp. XXI and XXXII.

[n] And the new value of the longitude of Sydney.

THE COMPUTATION OF LUNAR DISTANCES.

The tables of lunar distances formerly given on pages XIII to XVIII, inclusive, for each month of the Greenwich Ephemeris, are omitted, as it has been decided by the authorities of the Navy Department that they are now of little practical use to navigators. However, in case it is desired to use this method, the angular distance between the Moon and any heavenly body may be calculated by solving the spherical triangle of which the known parts are the polar distances of the Moon and the other body and the difference of their right ascensions, or, in other words, the angle at the pole between their hour-circles. Then, the Greenwich mean time of the observation being approximately known, and the lunar distances for the star or other body calculated for the even hour before and after, the required lunar distance may be interpolated and the longitude derived by the methods given in books on navigation.

EXAMPLE 1.

Find the lunar distance of Aldebaran, May 9, 1916, at 6 P. M. Greenwich Mean Time.

Let α and δ = Right Ascension and Declination of the star
" α' and δ' = " " " " " " Moon
" D = Lunar Distance
Also let $\tan M = \tan \delta' \sec (\alpha - \alpha')$
Then $\cos D = \sin \delta' \cos (M - \delta) \operatorname{cosec} M$

$\alpha = 4^h\ 31^m\ 6^s.7$
$\alpha' = 8^h\ 56^m\ 37^s.1$
$\alpha - \alpha' = 19^h\ 34^m\ 29^s.6$
$\alpha - \alpha' = 293°\ 37'\ 24''$
$\delta' = +\ 16°\ 21'\ 38''$
$\tan \delta' = 9.467709$
$\sec (\alpha - \alpha') = \underline{0.397157}$
$\tan M = 9.864866$

$M = 36°\ 13'\ 35''$
$\delta = +16°\ 20'\ 35''$
$M - \delta = 19°\ 53'\ 0''$
$\sin \delta' = 9.449758$
$\cos (M - \delta) = 9.973307$
$\operatorname{cosec} M = \underline{0.228429}$
$\cos D = 9.651494$
$D = 63°\ 22'\ 12''$

EXAMPLE 2.

Find the lunar distance of Jupiter, March 6, 1916, at noon, Greenwich Mean Time. In this case the distance is smaller and the following method is more accurate:

Let α and δ = Right Ascension and Declination of the planet
" α' and δ' = " " " " " " Moon
" D = Lunar Distance
Also let $\tan N = \tan \frac{1}{2} (\alpha - \alpha') \cos \frac{1}{2} (\delta + \delta') \operatorname{cosec} \frac{1}{2} (\delta - \delta')$
Then $\sin \frac{1}{2} D = \sin \frac{1}{2} (\alpha - \alpha') \cos \frac{1}{2} (\delta + \delta') \operatorname{cosec} N$
Sin N and $\sin \frac{1}{2} (\alpha - \alpha')$ have the same algebraic sign.

$\alpha = 0^h\ 21^m\ 4^s.8$
$\alpha' = 0^h\ 48^m\ 29^s.7$
$\alpha - \alpha' = 23^h\ 32^m\ 35^s.1$

$\alpha - \alpha' = 353°\ 8'\ 46''$
$\delta = +\ 1°\ 4'\ 49''$
$\delta' = +\ 10°\ 24'\ 19''$
$\delta + \delta' = +\ 11°\ 29'\ 8''$
$\delta - \delta' = -\ 9°\ 19'\ 30''$

$\frac{1}{2} (\alpha - \alpha') = 176°\ 34'\ 23''$
$\frac{1}{2} (\delta + \delta') = +\ 5°\ 44'\ 34''$
$\frac{1}{2} (\delta - \delta') = -\ 4°\ 39'\ 45''$

$\tan \frac{1}{2} (\alpha - \alpha') = 8.777268\ n$
$\cos \frac{1}{2} (\delta + \delta') = 9.997815$
$\operatorname{cosec} \frac{1}{2} (\delta - \delta') = \underline{1.089983\ n}$
$\tan N = 9.865066$
$N = 36°\ 14'\ 20''$

$\sin \frac{1}{2} (\alpha - \alpha') = 8.776490$
$\cos \frac{1}{2} (\delta + \delta') = 9.997815$
$\operatorname{cosec} N = \underline{0.228300}$
$\sin \frac{1}{2} D = 9.002605$
$\frac{1}{2} D = 5°\ 46'\ 26''$
$D = 11°\ 32'\ 52''$

TABLE I.

FOR FINDING THE LATITUDE BY AN OBSERVED ALTITUDE OF POLARIS, 1916.

Reduce the observed altitude of Polaris to the true altitude.

Reduce the recorded time of observation to the local sidereal time.

Take out the App. R. A. and App. Decl. of Polaris for the time of observation.

Subtract the App. R. A. from the local sidereal time of observation and the remainder is the hour-angle of Polaris.

With this hour-angle as the vertical argument, and the App. Decl. of Polaris as the horizontal argument, take out the correction from Table I and add it to or subtract it from the true altitude, according to its sign.

For other altitudes than 45°, corrections taken from the supplementary table at the bottom of Table I (Table Ia) may be applied when necessary for the degree of accuracy required.

Example.—1916, August 5, at $10^h\ 40^m\ 30^s$ P. M. local mean solar time, in longitude 59° west of Greenwich, suppose the true altitude of Polaris to be 33° 20′ 0″, required the latitude of the place.

	h	m	s
Local astronomical mean time	10	40	30
Reduction from Table III for $10^h\ 40^m\ 30^s$		+ 1	45
Greenwich sidereal time of mean noon, August 5, page 10	8	54	49
Reduction from Table III, for longitude (=$3^h\ 56^m$ west, or plus)		+ 0	39
	h	m	s
Sum (having regard to signs) is equal to local sidereal time	19	37	43
R. A. of Polaris (page 281) for time of observation	1	30	18
	h	m	s
Remainder is equal to hour-angle of Polaris	18	7	25
Decl. of Polaris (page 281) for time of observation 88° 51′ 25″			
	°	′	″
True altitude	+33	20	0
Correction from Table I		−1	32
Correction from Table Ia			−14
	°	′	″
Latitude of the place	+33	18	14

Observations of Polaris for latitude should be made when practicable near the times of upper or of lower culminations (hour-angle 0^h or 12^h). However, at sea, if made near elongation (hour-angle 6^h or 18^h), the hour-angle, and hence the local time, should be known within one minute.

Decl. / H. A.	88° 51′ 20″		88° 51′ 30″		88° 51′ 40″		88° 51′ 50″		88° 52′ 0″		88° 52′ 10″		Decl. / H. A.
h m	′ ″		′ ″		′ ″		′ ″		′ ″		′ ″		h m
0 0	−68 40	0	−68 30	0	−68 20	0	−68 10	0	−68 0	0	−67 50	0	24 0
3	68 40	1	68 30	1	68 20	1	68 10	1	68 0	1	67 50	1	23 57
6	68 39	2	68 29	2	68 19	2	68 9	2	67 59	2	67 49	2	54
9	68 37	3	68 27	3	68 17	3	68 7	3	67 57	3	67 47	3	51
12	68 34	3	68 24	3	68 14	3	68 4	3	67 54	3	67 44	3	48
0 15	−68 31	4	−68 21	4	−68 11	4	−68 1	4	−67 51	4	−67 41	4	23 45
18	68 27	5	68 17	5	68 7	5	67 57	5	67 47	4	67 37	4	42
21	68 22	5	68 12	5	68 2	5	67 52	5	67 43	6	67 33	6	39
24	68 17	6	68 7	6	67 57	6	67 47	6	67 37	6	67 27	6	36
27	68 11	7	68 1	7	67 51	7	67 41	7	67 31	7	67 21	7	33
0 30	−68 4	8	−67 54	7	−67 44	7	−67 34	7	−67 24	7	−67 14	7	23 30
33	67 56	8	67 47	8	67 37	8	67 27	8	67 17	8	67 7	8	27
36	67 48	9	67 39	9	67 29	9	67 19	9	67 9	9	66 59	9	24
39	67 39	9	67 30	10	67 20	10	67 10	10	67 0	10	66 50	9	21
42	67 30	11	67 20	10	67 10	10	67 0	10	66 50	10	66 41	11	18
0 45	−67 19	11	−67 10	11	−67 0	11	−66 50	11	−66 40	11	−66 30	11	23 15
48	67 8	12	66 59	12	66 49	12	66 39	12	66 29	12	66 19	11	12
51	66 56	12	66 47	13	66 37	13	66 27	12	66 17	12	66 8	13	9
54	66 44	13	66 34	13	66 24	13	66 15	13	66 5	13	65 55	13	6
0 57	66 31	14	66 21	14	66 11	13	66 2	14	65 52	14	65 42	13	3
1 0	−66 17	15	−66 7	14	−65 58	15	−65 48	14	−65 38	14	−65 29	15	23 0
3	66 2	15	65 53	15	65 43	15	65 34	16	65 24	15	65 14	15	22 57
6	65 47	16	65 38	16	65 28	16	65 18	16	65 9	16	64 59	16	54
9	65 31	17	65 22	17	65 12	16	65 2	16	64 53	17	64 43	16	51
1 12	−65 14		−65 5		−64 56		−64 46		−64 36		−64 27		22 48

TABLE I.

FOR FINDING THE LATITUDE BY AN OBSERVED ALTITUDE OF POLARIS, 1914.

Decl. H. A.	88° 51′ 20″		88° 51′ 30″		88° 51′ 40″		88° 51′ 50″		88° 52′ 0″		88° 52′ 10″		Decl. H. A.
h m	′ ″		′ ″		′ ″		′ ″		′ ″		′ ″		h m
1 12	−65 14	17	−65 5	17	−64 56	18	−64 46	17	−64 36	17	−64 27	17	22 48
15	64 57	18	64 48	18	64 38	18	64 29	18	64 19	17	64 10	18	45
18	64 39	19	64 30	19	64 20	18	64 11	19	64 2	19	63 52	18	42
21	64 20	19	64 11	19	64 2	20	63 52	19	63 43	19	63 34	19	39
24	64 1	20	63 52	20	63 42	20	63 33	20	63 24	20	63 15	20	36
1 27	−63 41	21	−63 32	21	−63 22	20	−63 13	20	−63 4	20	−62 55	21	22 33
30	63 20	21	63 11	21	63 2	21	62 53	21	62 44	21	62 34	21	30
33	62 59	22	62 50	22	62 41	22	62 32	22	62 23	22	62 13	21	27
36	62 37	23	62 28	23	62 19	23	62 10	23	62 1	23	61 52	23	24
39	62 14	23	62 5	23	61 56	23	61 47	23	61 38	23	61 29	23	21
1 42	−61 51	24	−61 42	24	−61 33	24	−61 24	24	−61 15	24	−61 6	24	22 18
45	61 27	25	61 18	24	61 9	24	61 0	25	60 51	24	60 42	24	15
48	61 2	25	60 54	25	60 45	25	60 35	25	60 27	25	60 18	25	12
51	60 37	26	60 29	26	60 20	26	60 10	25	60 2	25	59 53	25	9
54	60 11	26	60 3	27	59 54	26	59 45	26	59 37	27	59 28	26	6
1 57	−59 45	27	−59 36	27	−59 28	27	−59 19	27	−59 10	27	−59 2	27	22 3
2 0	59 18	28	59 9	28	59 1	28	58 52	28	58 43	27	58 35	28	22 0
3	58 50	28	58 41	28	58 33	28	58 24	28	58 16	28	58 7	28	21 57
6	58 22	29	58 13	29	58 5	29	57 56	28	57 48	29	57 39	28	54
9	57 53	30	57 44	29	57 36	29	57 28	30	57 19	29	57 11	29	51
2 12	−57 23	30	−57 15	30	−57 7	30	−56 58	30	−56 50	30	−56 42	30	21 48
15	56 53	31	56 45	31	56 37	31	56 28	30	56 20	30	56 12	31	45
18	56 22	31	56 14	31	56 6	31	55 58	31	55 50	31	55 41	31	42
21	55 51	32	55 43	32	55 35	32	55 27	32	55 19	32	55 10	31	39
24	55 19	33	55 11	32	55 3	32	54 55	32	54 47	32	54 39	32	36
2 27	−54 46	33	−54 39	33	−54 31	33	−54 23	33	−54 15	33	−54 7	33	21 33
30	54 13	33	54 6	34	53 58	34	53 50	34	53 42	33	53 34	33	30
33	53 40	34	53 32	34	53 24	34	53 16	34	53 9	34	53 1	34	27
36	53 6	35	52 58	35	52 50	34	52 42	34	52 35	34	52 27	34	24
39	52 31	35	52 23	35	52 16	35	52 8	35	52 1	35	51 53	35	21
2 42	−51 56	36	−51 48	36	−51 41	36	−51 33	35	−51 26	36	−51 18	35	21 18
45	51 20	37	51 12	36	51 5	36	50 58	36	50 50	36	50 43	36	15
48	50 43	37	50 36	37	50 29	37	50 22	37	50 14	36	50 7	37	12
51	50 6	37	49 59	37	49 52	37	49 45	37	49 38	37	49 30	37	9
54	49 29	38	49 22	38	49 15	38	49 8	38	49 1	38	48 53	37	6
2 57	−48 51	38	−48 44	38	−48 37	38	−48 30	38	−48 23	38	−48 16	38	21 3
3 0	48 13	39	48 6	39	47 59	39	47 52	39	47 45	39	47 38	38	21 0
3	47 34	39	47 27	39	47 20	39	47 13	39	47 6	39	47 0	39	20 57
6	46 55	40	46 48	40	46 41	40	46 34	39	46 27	39	46 21	40	54
9	46 15	41	46 8	40	46 1	40	45 55	40	45 48	40	45 41	40	51
3 12	−45 34	41	−45 28	41	−45 21	41	−45 15	41	−45 8	40	−45 1	40	20 48
15	44 53	41	44 47	41	44 40	41	44 34	41	44 28	41	44 21	41	45
18	44 12	42	44 6	42	43 59	41	43 53	41	43 47	42	43 40	41	42
21	43 30	42	43 24	42	43 18	42	43 12	42	43 5	42	42 59	42	39
24	42 48	43	42 42	43	42 36	43	42 30	43	42 23	42	42 17	42	36
3 27	−42 5	43	−41 59	43	−41 53	43	−41 47	43	−41 41	42	−41 35	42	20 33
30	41 22	43	41 16	43	41 10	43	41 4	43	40 59	43	40 53	43	30
33	40 39	44	40 33	44	40 27	43	40 21	43	40 16	44	40 10	44	27
36	39 55	44	39·49	44	39 44	44	39 38	44	39 32	44	39 26	44	24
39	39 11	45	39 5	45	39 00	45	38 54	45	38 48	44	38 42	44	21
3 42	−38 26	45	−38 20	45	−38 15	45	−38 9	45	−38 4	45	−37 58	44	20 18
45	37 41	46	37 35	45	37 30	45	37 24	45	37 19	45	37 14	45	15
48	36 55	46	36 50	46	36 45	46	36 39	45	36 34	46	36 29	46	12
51	36 9	46	36 4	46	35 59	46	35 54	46	35 48	45	35 43	45	9
54	35 23	47	35 18	47	35 13	46	35 8	46	35 3	46	34 58	46	6
3 57	−34 36	47	−34 31	47	−34 27	47	−34 22	47	−34 17	47	−34 12	47	20 3
4 0	33 49	47	33 44	47	33 40	47	33 35	47	33 30	47	33 25	47	20 0
3	33 2	48	32 57	47	32 53	48	32 48	48	32 43	47	32 38	47	19 57
6	32 14	48	32 10	48	32 5	48	32 0	47	31 56	48	31 51	47	54
4 9	−31 26		−31 22		−31 17		−31 13		−31 8		−31 4		19 51

TABLE I.

FOR FINDING THE LATITUDE BY AN OBSERVED ALTITUDE OF POLARIS, 1916.

H. A. \ Decl.	88° 51′ 20″		88° 51′ 30″		88° 51′ 40″		88° 51′ 50″		88° 52′ 0″		88° 52′ 10″		Decl. / H. A.
h m	′ ″		′ ″		′ ″		′ ″		′ ″		′ ″		h m
4 9	−31 26	48	−31 22	48	−31 17	48	−31 13	48	−31 8	48	−31 4	48	19 51
12	30 38	49	30 34	49	30 29	48	30 25	49	30 20	48	30 16	48	48
15	29 49	49	29 45	49	29 41	49	29 36	49	29 32	49	29 28	48	45
18	29 0	49	28 56	49	28 52	49	28 47	48	28 43	48	28 40	49	42
21	28 11	49	28 7	49	28 3	49	27 59	49	27 55	49	27 51	49	39
4 24	−27 22	50	−27 18	50	−27 14	50	−27 10	50	−27 6	49	−27 2	49	19 36
27	26 32	50	26 28	50	26 24	50	26 20	49	26 17	50	26 13	49	33
30	25 42	51	25 38	50	25 34	50	25 31	50	25 27	50	25 24	50	30
33	24 51	50	24 48	51	24 44	50	24 41	50	24 37	50	24 34	50	27
36	24 1	51	23 57	50	23 54	51	23 51	51	23 47	50	23 44	50	24
4 39	−23 10	51	−23 7	51	−23 3	51	−23 0	51	−22 57	51	−22 54	51	19 21
42	22 19	52	22 16	51	22 12	51	22 9	51	22 6	51	22 3	50	18
45	21 27	51	21 25	52	21 21	51	21 18	51	21 15	51	21 13	51	15
48	20 36	52	20 33	51	20 30	51	20 27	51	20 24	51	20 22	51	12
51	19 44	52	19 42	52	19 39	52	19 36	52	19 33	51	19 31	52	9
4 54	−18 52	52	−18 50	52	−18 47	52	−18 44	51	−18 42	52	−18 39	51	19 6
4 57	18 0	52	17 58	52	17 55	52	17 53	52	17 50	52	17 48	52	3
5 0	17 8	52	17 6	53	17 3	52	17 1	52	16 58	51	16 56	52	19 0
3	16 16	53	16 13	52	16 11	52	16 9	52	16 7	52	16 4	52	18 57
6	15 23	53	15 21	53	15 19	52	15 17	53	15 15	53	15 12	52	54
5 9	−14 30	53	−14 28	52	−14 27	53	−14 24	52	−14 22	52	−14 20	52	18 51
12	13 37	53	13 36	53	13 34	53	13 32	53	13 30	53	13 28	52	48
15	12 44	53	12 43	53	12 41	53	12 39	53	12 37	52	12 36	53	45
18	11 51	53	11 50	54	11 48	53	11 46	53	11 45	53	11 43	53	42
21	10 58	54	10 56	53	10 55	53	10 53	53	10 52	53	10 50	52	39
5 24	−10 4	53	−10 3	53	−10 2	53	−10 0	53	− 9 59	53	− 9 58	53	18 36
27	9 11	54	9 10	54	9 9	53	9 7	53	9 6	53	9 5	53	33
30	8 17	53	8 16	53	8 16	54	8 14	53	8 13	53	8 12	53	30
33	7 24	54	7 23	54	7 22	54	7 21	53	7 20	53	7 19	53	27
36	6 30	54	6 29	54	6 28	53	6 28	54	6 27	54	6 26	53	24
5 39	− 5 36	54	− 5 35	53	− 5 35	54	− 5 34	53	− 5 33	53	− 5 33	53	18 21
42	4 42	54	4 42	54	4 41	53	4 41	53	4 40	53	4 40	54	18
45	3 48	53	3 48	54	3 48	54	3 48	54	3 47	54	3 46	53	15
48	2 55	54	2 54	53	2 54	54	2 54	54	2 53	53	2 53	53	12
51	2 1	54	2 1	54	2 0	53	2 0	54	2 0	54	2 0	54	9
5 54	− 1 7	54	− 1 7	54	− 1 7	54	− 1 6	53	− 1 6	53	− 1 6	53	18 6
5 57	− 0 13	54	− 0 13	54	− 0 13	54	− 0 13	54	− 0 13	53	− 0 13	53	3
6 0	+ 0 41	54	+ 0 41	54	+ 0 41	53	+ 0 41	53	+ 0 40	54	+ 0 40	53	18 0
3	1 35	54	1 35	53	1 34	54	1 34	54	1 34	53	1 33	54	17 57
6	2 29	54	2 28	54	2 28	54	2 28	53	2 27	53	2 27	53	54
6 9	+ 3 23	54	+ 3 22	54	+ 3 22	53	+ 3 21	54	+ 3 20	54	+ 3 20	53	17 51
12	4 17	53	4 16	53	4 15	54	4 15	53	4 14	53	4 13	53	48
15	5 10	54	5 9	54	5 9	53	5 8	53	5 7	53	5 6	53	45
18	6 4	54	6 3	53	6 2	54	6 1	53	6 0	53	5 59	53	42
21	6 58	53	6 56	54	6 56	53	6 54	54	6 53	53	6 52	53	39
6 24	+ 7 51	54	+ 7 50	53	+ 7 49	53	+ 7 48	53	+ 7 46	53	+ 7 45	53	17 36
27	8 45	53	8 43	54	8 42	53	8 41	53	8 39	53	8 38	53	33
30	9 38	54	9 37	53	9 35	53	9 34	53	9 32	53	9 31	52	30
33	10 32	53	10 30	53	10 28	53	10 27	52	10 25	53	10 23	53	27
36	11 25	53	11 23	53	11 21	53	11 19	53	11 18	52	11 16	52	24
6 39	+12 18	52	+12 16	52	+12 14	53	+12 12	53	+12 10	53	+12 8	53	17 21
42	13 10	53	13 8	53	13 7	52	13 5	52	13 3	52	13 1	52	18
45	14 3	53	14 1	53	13 59	53	13 57	52	13 55	52	13 53	52	15
48	14 56	52	14 54	52	14 52	52	14 49	52	14 47	52	14 45	52	12
51	15 48	53	15 46	52	15 44	52	15 41	52	15 39	52	15 37	51	9
6 54	+16 41	52	+16 38	52	+16 36	52	+16 33	52	+16 31	51	+16 28	52	17 6
6 57	17 33	52	17 30	52	17 28	51	17 25	51	17 22	52	17 20	51	3
7 0	18 25	51	18 22	52	18 19	52	18 16	52	18 14	51	18 11	51	17 0
3	19 16	52	19 14	51	19 11	51	19 8	51	19 5	51	19 2	51	16 57
7 6	+20 8		+20 5		+20 2		+19 59		+19 56		+19 53		16 54

TABLE I.

FOR FINDING THE LATITUDE BY AN OBSERVED ALTITUDE OF POLARIS, 1916.

Decl. / H. A.	88° 51′ 20″		88° 51′ 30″		88° 51′ 40″		88° 51′ 50″		88° 52′ 0″		88° 52′ 10″		Decl. / H. A.
h m	′ ″		′ ″		′ ″		′ ″		′ ″		′ ″		h m
7 6	+20 8	51	+20 5	51	+20 2	51	+19 59	51	+19 56	51	+19 53	51	16 54
9	20 59	51	20 56	51	20 53	51	20 50	51	20 47	50	20 44	50	51
12	21 50	51	21 47	51	21 44	51	21 41	50	21 37	51	21 34	50	48
15	22 41	51	22 38	50	22 35	50	22 31	50	22 28	50	22 24	50	45
18	23 32	50	23 28	51	23 25	50	23 21	50	23 18	50	23 14	50	42
7 21	+24 22	50	+24 19	50	+24 15	50	+24 11	50	+24 8	49	+24 4	50	16 39
24	25 12	50	25 9	49	25 5	50	25 1	50	24 57	50	24 54	49	36
27	26 2	50	25 58	50	25 55	49	25 51	49	25 47	49	25 43	49	33
30	26 52	49	26 48	49	26 44	49	26 40	50	26 36	49	26 32	49	30
33	27 41	49	27 37	49	27 33	49	27 30	48	27 25	48	27 21	48	27
7 36	+28 30	49	+28 26	48	+28 22	48	+28 18	48	+28 13	49	+28 9	48	16 24
39	29 19	48	29 14	49	29 10	48	29 6	48	29 2	48	28 57	48	21
42	30 7	48	30 3	48	29 58	48	29 54	48	29 50	47	29 45	48	18
45	30 55	48	30 51	47	30 46	48	30 42	47	30 37	47	30 33	47	15
48	31 43	48	31 38	48	31 34	47	31 29	47	31 24	47	31 20	47	12
7 51	+32 31	47	+32 26	47	+32 21	47	+32 16	47	+32 11	47	+32 7	46	16 9
54	33 18	47	33 13	46	33 8	47	33 3	47	32 58	46	32 53	46	6
7 57	34 5	46	33 59	47	33 55	46	33 50	46	33 44	46	33 39	46	3
8 0	34 51	46	34 46	46	34 41	46	34 36	45	34 30	46	34 25	46	16 0
3	35 37	46	35 32	45	35 27	45	35 21	46	35 16	45	35 11	45	15 57
8 6	+36 23	45	+36 17	45	+36 12	45	+36 7	45	+36 1	45	+35 56	45	15 54
9	37 8	45	37 2	45	36 57	45	36 52	44	36 46	45	36 41	44	51
12	37 53	44	37 47	45	37 42	44	37 36	44	37 31	44	37 25	44	48
15	38 37	45	38 32	44	38 26	44	38 20	44	38 15	43	38 9	44	45
18	39 22	43	39 16	43	39 10	44	39 4	44	38 58	44	38 53	43	42
8 21	+40 5	44	+39 59	44	+39 54	43	+39 48	43	+39 42	43	+39 36	43	15 39
24	40 49	43	40 43	43	40 37	43	40 31	42	40 25	42	40 19	42	36
27	41 32	42	41 26	42	41 20	42	41 13	42	41 7	42	41 1	42	33
30	42 14	42	42 8	42	42 2	42	41 55	42	41 49	42	41 43	42	30
33	42 56	42	42 50	41	42 44	41	42 37	42	42 31	41	42 25	41	27
8 36	+43 38	41	+43 31	41	+43 25	41	+43 19	41	+43 12	41	+43 6	41	15 24
39	44 19	41	44 12	41	44 6	40	44 0	40	43 53	40	43 47	40	21
42	45 0	40	44 53	40	44 46	40	44 40	40	44 33	40	44 27	40	18
45	45 40	40	45 33	40	45 26	40	45 20	39	45 13	39	45 7	39	15
48	46 20	39	46 13	39	46 6	39	45 59	39	45 52	39	45 46	39	12
8 51	+46 59	39	+46 52	39	+46 45	39	+46 38	39	+46 31	39	+46 25	38	15 9
54	47 38	38	47 31	38	47 24	38	47 17	38	47 10	38	47 3	38	6
8 57	48 16	38	48 9	38	48 2	38	47 55	38	47 48	37	47 41	37	3
9 0	48 54	37	48 47	37	48 40	37	48 33	37	48 25	37	48 18	37	15 0
3	49 31	37	49 24	37	49 17	37	49 10	36	49 2	37	48 55	36	14 57
9 6	+50 8	36	+50 1	36	+49 54	36	+49 46	36	+49 39	36	+49 31	36	14 54
9	50 44	36	50 37	36	50 30	35	50 22	36	50 15	35	50 7	36	51
12	51 20	35	51 13	35	51 5	35	50 58	35	50 50	35	50 43	35	48
15	51 55	35	51 48	35	51 40	35	51 33	34	51 25	35	51 18	34	45
18	52 30	34	52 23	34	52 15	34	52 7	34	52 0	34	51 52	34	42
9 21	+53 4	34	+52 57	33	+52 49	34	+52 41	34	+52 34	33	+52 26	33	14 39
24	53 38	33	53 30	33	53 23	33	53 15	33	53 7	33	52 59	33	36
27	54 11	33	54 3	33	53 56	32	53 48	32	53 40	32	53 32	32	33
30	54 44	32	54 36	32	54 28	32	54 20	32	54 12	32	54 4	32	30
33	55 16	31	55 8	31	55 0	31	54 52	31	54 44	31	54 36	31	27
9 36	+55 47	31	+55 39	31	+55 31	31	+55 23	31	+55 15	30	+55 7	30	14 24
39	56 18	31	56 10	30	56 2	30	55 54	30	55 45	30	55 37	30	21
42	56 49	30	56 40	30	56 32	30	56 24	29	56 15	30	56 7	30	18
45	57 19	29	57 10	29	57 2	29	56 53	29	56 45	29	56 37	29	15
48	57 48	28	57 39	29	57 31	28	57 22	29	57 14	28	57 6	28	12
9 51	+58 16	28	+58 8	28	+57 59	28	+57 51	28	+57 42	28	+57 34	27	14 9
54	58 44	28	58 36	27	58 27	27	58 19	27	58 10	27	58 1	27	6
9 57	59 12	27	59 3	27	58 54	27	58 46	26	58 37	27	58 28	27	3
10 0	59 39	26	59 30	26	59 21	26	59 12	26	59 4	26	58 55	26	14 0
10 3	*+60 5*		+59 56		+59 47		+59 38		+59 30		+59 21		13 57

TABLE I.

FOR FINDING THE LATITUDE BY AN OBSERVED ALTITUDE OF POLARIS, 1916.

Decl. H. A.	88° 51′ 20″		88° 51′ 30″		88° 51′ 40″		88° 51′ 50″		88° 52′ 0″		88° 52′ 10″		Decl. H. A.
h m	′ ″		′ ″		′ ″		′ ″		′ ″		′ ″		h m
10 3	+60 5	25	+59 56	25	+59 47	26	+59 38	26	+59 30	25	+59 21	25	13 57
6	60 30	25	60 21	25	60 13	24	60 4	24	59 55	25	59 46	25	54
9	60 55	24	60 46	24	60 37	25	60 28	25	60 20	24	60 11	24	51
12	61 19	24	61 10	24	61 2	23	60 53	23	60 44	23	60 35	23	48
15	61 43	23	61 34	23	61 25	23	61 16	23	61 7	23	60 58	23	45
10 18	+62 6	23	+61 57	22	+61 48	23	+61 39	23	+61 30	22	+61 21	22	13 42
21	62 29	22	62 19	22	62 11	21	62 2	21	61 52	22	61 43	22	39
24	62 51	21	62 41	21	62 32	21	62 23	21	62 14	21	62 5	21	36
27	63 12	21	63 2	21	62 53	21	62 44	21	62 35	20	62 26	20	33
30	63 33	20	63 23	20	63 14	20	63 5	19	62 55	20	62 46	20	30
10 33	+63 53	19	+63 43	19	+63 34	19	+63 24	20	+63 15	19	+63 6	19	13 27
36	64 12	18	64 2	19	63 53	19	63 44	18	63 34	19	63 25	18	24
39	64 30	18	64 21	18	64 12	17	64 2	18	63 53	18	63 43	18	21
42	64 48	17	64 39	17	64 29	18	64 20	17	64 11	17	64 1	17	18
45	65 5	17	64 56	17	64 47	16	64 37	17	64 28	16	64 18	17	15
10 48	+65 22	16	+65 13	16	+65 3	16	+64 54	16	+64 44	16	+64 35	16	13 12
51	65 38	15	65 29	15	65 19	15	65 10	15	65 0	15	64 51	15	9
54	65 53	15	65 44	15	65 34	15	65 25	15	65 15	15	65 6	14	6
10 57	66 8	14	65 59	14	65 49	14	65 40	14	65 30	14	65 20	14	3
11 0	66 22	13	66 13	13	66 3	13	65 54	13	65 44	13	65 34	13	13 0
11 3	+66 35	13	+66 26	13	+66 16	13	+66 7	12	+65 57	12	+65 47	13	12 57
6	66 48	12	66 39	12	66 29	12	66 19	12	66 9	12	66 0	12	54
9	67 0	12	66 51	11	66 41	11	66 31	11	66 21	12	66 12	11	51
12	67 12	11	67 2	11	66 52	11	66 42	11	66 33	10	66 23	10	48
15	67 23	10	67 13	10	67 3	10	66 53	10	66 43	10	66 33	10	45
11 18	+67 33	9	+67 23	9	+67 13	9	+67 3	9	+66 53	9	+66 43	9	12 42
21	67 42	8	67 32	8	67 22	8	67 12	8	67 2	9	66 52	9	39
24	67 50	8	67 40	8	67 30	8	67 20	8	67 11	8	67 1	8	36
27	67 58	7	67 48	7	67 38	8	67 28	8	67 19	7	67 9	7	33
30	68 5	7	67 55	7	67 46	6	67 36	6	67 26	6	67 16	6	30
11 33	+68 12	6	+68 2	6	+67 52	6	+67 42	6	+67 32	6	+67 22	6	12 27
36	68 18	5	68 8	5	67 58	5	67 48	5	67 38	5	67 28	5	24
39	68 23	5	68 13	4	68 3	5	67 53	5	67 43	5	67 33	5	21
42	68 28	4	68 17	4	68 8	3	67 58	3	67 48	3	67 38	3	18
45	68 32	3	68 21	3	68 11	3	68 1	3	67 51	3	67 41	3	15
11 48	+68 35	2	+68 24	3	+68 14	3	+68 4	3	+67 54	3	+67 44	3	12 12
51	68 37	2	68 27	2	68 17	2	68 7	2	67 57	2	67 47	2	9
54	68 39	1	68 29	1	68 19	1	68 9	1	67 59	1	67 49	1	6
11 57	68 40	0	68 30	0	68 20	0	68 10	0	68 0	0	67 50	0	3
12 0	+68 40		+68 30		+68 20		+68 10		+68 0		+67 50		12 0

TABLE Ia.

Table I has been computed for an altitude of 45°. For other altitudes, corrections taken from the following table may be applied when the desired degree of accuracy requires it.

Altitude. H. A.		10°	20°	30°	40°	50°	60°	70°	Altitude. H. A.	
h	h	″	″	″	″	″	″	″	h	h
0	12	0	0	0	0	0	0	0	12	24
1	11	− 2	− 2	− 1	0	0	+ 2	+ 5	13	23
2	10	8	7	4	−2	+2	8	18	14	22
3	9	17	13	9	3	4	15	36	15	21
4	8	25	20	13	5	6	23	54	16	20
5	7	32	24	16	6	7	28	67	17	19
6	6	−34	−26	−17	−7	+8	+30	+72	18	18

TABLE II.

SIDEREAL INTO MEAN SOLAR TIME.

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.

Sidereal.	0^{h}	1^{h}	2^{h}	3^{h}	4^{h}	5^{h}	6^{h}	7^{h}	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	0 0.000	0 9.830	0 19.659	0 29.489	0 39.318	0 49.148	0 58.977	1 8.807	0	0.000
1	0 0.164	0 9.993	0 19.823	0 29.653	0 39.482	0 49.312	0 59.141	1 8.971	1	0.003
2	0 0.328	0 10.157	0 19.987	0 29.816	0 39.646	0 49.475	0 59.305	1 9.135	2	0.005
3	0 0.491	0 10.321	0 20.151	0 29.980	0 39.810	0 49.639	0 59.469	1 9.298	3	0.008
4	0 0.655	0 10.485	0 20.314	0 30.144	0 39.974	0 49.803	0 59.633	1 9.462	4	0.011
5	0 0.819	0 10.649	0 20.478	0 30.308	0 40.137	0 49.967	0 59.796	1 9.626	5	0.014
6	0 0.983	0 10.813	0 20.642	0 30.472	0 40.301	0 50.131	0 59.960	1 9.790	6	0.016
7	0 1.147	0 10.976	0 20.806	0 30.635	0 40.465	0 50.295	1 0.124	1 9.954	7	0.019
8	0 1.311	0 11.140	0 20.970	0 30.799	0 40.629	0 50.458	1 0.288	1 10.118	8	0.022
9	0 1.474	0 11.304	0 21.134	0 30.963	0 40.793	0 50.622	1 0.452	1 10.281	9	0.025
10	0 1.638	0 11.468	0 21.297	0 31.127	0 40.956	0 50.786	1 0.616	1 10.445	10	0.027
11	0 1.802	0 11.632	0 21.461	0 31.291	0 41.120	0 50.950	1 0.779	1 10.609	11	0.030
12	0 1.966	0 11.795	0 21.625	0 31.455	0 41.284	0 51.114	1 0.943	1 10.773	12	0.033
13	0 2.130	0 11.959	0 21.789	0 31.618	0 41.448	0 51.278	1 1.107	1 10.937	13	0.035
14	0 2.294	0 12.123	0 21.953	0 31.782	0 41.612	0 51.441	1 1.271	1 11.100	14	0.038
15	0 2.457	0 12.287	0 22.117	0 31.946	0 41.776	0 51.605	1 1.435	1 11.264	15	0.041
16	0 2.621	0 12.451	0 22.280	0 32.110	0 41.939	0 51.769	1 1.599	1 11.428	16	0.044
17	0 2.785	0 12.615	0 22.444	0 32.274	0 42.103	0 51.933	1 1.762	1 11.592	17	0.046
18	0 2.949	0 12.778	0 22.608	0 32.438	0 42.267	0 52.097	1 1.926	1 11.756	18	0.049
19	0 3.113	0 12.942	0 22.772	0 32.601	0 42.431	0 52.260	1 2.090	1 11.920	19	0.052
20	0 3.277	0 13.106	0 22.936	0 32.765	0 42.595	0 52.424	1 2.254	1 12.083	20	0.055
21	0 3.440	0 13.270	0 23.099	0 32.929	0 42.759	0 52.588	1 2.418	1 12.247	21	0.057
22	0 3.604	0 13.434	0 23.263	0 33.093	0 42.922	0 52.752	1 2.582	1 12.411	22	0.060
23	0 3.768	0 13.598	0 23.427	0 33.257	0 43.086	0 52.916	1 2.745	1 12.575	23	0.063
24	0 3.932	0 13.761	0 23.591	0 33.420	0 43.250	0 53.080	1 2.909	1 12.739	24	0.066
25	0 4.096	0 13.925	0 23.755	0 33.584	0 43.414	0 53.243	1 3.073	1 12.903	25	0.068
26	0 4.259	0 14.089	0 23.919	0 33.748	0 43.578	0 53.407	1 3.237	1 13.066	26	0.071
27	0 4.423	0 14.253	0 24.082	0 33.912	0 43.742	0 53.571	1 3.401	1 13.230	27	0.074
28	0 4.587	0 14.417	0 24.246	0 34.076	0 43.905	0 53.735	1 3.564	1 13.394	28	0.076
29	0 4.751	0 14.581	0 24.410	0 34.240	0 44.069	0 53.899	1 3.728	1 13.558	29	0.079
30	0 4.915	0 14.744	0 24.574	0 34.403	0 44.233	0 54.063	1 3.892	1 13.722	30	0.082
31	0 5.079	0 14.908	0 24.738	0 34.567	0 44.397	0 54.226	1 4.056	1 13.886	31	0.085
32	0 5.242	0 15.072	0 24.902	0 34.731	0 44.561	0 54.390	1 4.220	1 14.049	32	0.087
33	0 5.406	0 15.236	0 25.065	0 34.895	0 44.724	0 54.554	1 4.384	1 14.213	33	0.090
34	0 5.570	0 15.400	0 25.229	0 35.059	0 44.888	0 54.718	1 4.547	1 14.377	34	0.093
35	0 5.734	0 15.563	0 25.393	0 35.223	0 45.052	0 54.882	1 4.711	1 14.541	35	0.096
36	0 5.898	0 15.727	0 25.557	0 35.386	0 45.216	0 55.046	1 4.875	1 14.705	36	0.098
37	0 6.062	0 15.891	0 25.721	0 35.550	0 45.380	0 55.209	1 5.039	1 14.868	37	0.101
38	0 6.225	0 16.055	0 25.885	0 35.714	0 45.544	0 55.373	1 5.203	1 15.032	38	0.104
39	0 6.389	0 16.219	0 26.048	0 35.878	0 45.707	0 55.537	1 5.367	1 15.196	39	0.106
40	0 6.553	0 16.383	0 26.212	0 36.042	0 45.871	0 55.701	1 5.530	1 15.360	40	0.109
41	0 6.717	0 16.546	0 26.376	0 36.206	0 46.035	0 55.865	1 5.694	1 15.524	41	0.112
42	0 6.881	0 16.710	0 26.540	0 36.369	0 46.199	0 56.028	1 5.858	1 15.688	42	0.115
43	0 7.045	0 16.874	0 26.704	0 36.533	0 46.363	0 56.192	1 6.022	1 15.851	43	0.117
44	0 7.208	0 17.038	0 26.867	0 36.697	0 46.527	0 56.356	1 6.186	1 16.015	44	0.120
45	0 7.372	0 17.202	0 27.031	0 36.861	0 46.690	0 56.520	1 6.350	1 16.179	45	0.123
46	0 7.536	0 17.366	0 27.195	0 37.025	0 46.854	0 56.684	1 6.513	1 16.343	46	0.126
47	0 7.700	0 17.529	0 27.359	0 37.188	0 47.018	0 56.848	1 6.677	1 16.507	47	0.128
48	0 7.864	0 17.693	0 27.523	0 37.352	0 47.182	0 57.011	1 6.841	1 16.671	48	0.131
49	0 8.027	0 17.857	0 27.687	0 37.516	0 47.346	0 57.175	1 7.005	1 16.834	49	0.134
50	0 8.191	0 18.021	0 27.850	0 37.680	0 47.510	0 57.339	1 7.169	1 16.998	50	0.137
51	0 8.355	0 18.185	0 28.014	0 37.844	0 47.673	0 57.503	1 7.332	1 17.162	51	0.139
52	0 8.519	0 18.349	0 28.178	0 38.008	0 47.837	0 57.667	1 7.496	1 17.326	52	0.142
53	0 8.683	0 18.512	0 28.342	0 38.171	0 48.001	0 57.831	1 7.660	1 17.490	53	0.145
54	0 8.847	0 18.676	0 28.506	0 38.335	0 48.165	0 57.994	1 7.824	1 17.654	54	0.147
55	0 9.010	0 18.840	0 28.670	0 38.499	0 48.329	0 58.158	1 7.988	1 17.817	55	0.150
56	0 9.174	0 19.004	0 28.833	0 38.663	0 48.492	0 58.322	1 8.152	1 17.981	56	0.153
57	0 9.338	0 19.168	0 28.997	0 38.827	0 48.656	0 58.486	1 8.315	1 18.145	57	0.156
58	0 9.502	0 19.331	0 29.161	0 38.991	0 48.820	0 58.650	1 8.479	1 18.309	58	0.158
59	0 9.666	0 19.495	0 29.325	0 39.154	0 48.984	0 58.814	1 8.643	1 18.473	59	0.161

TABLE II.

SIDEREAL INTO MEAN SOLAR TIME.

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.

Side-real.	8h	9h	10h	11h	12h	13h	14h	15h	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	1 18.636	1 28.466	1 38.296	1 48.125	1 57.955	2 7.784	2 17.614	2 27.443	0	0.000
1	1 18.800	1 28.630	1 38.459	1 48.289	1 58.119	2 7.948	2 17.778	2 27.607	1	0.003
2	1 18.964	1 28.794	1 38.623	1 48.453	1 58.282	2 8.112	2 17.941	2 27.771	2	0.005
3	1 19.128	1 28.958	1 38.787	1 48.617	1 58.446	2 8.276	2 18.105	2 27.935	3	0.008
4	1 19.292	1 29.121	1 38.951	1 48.780	1 58.610	2 8.440	2 18.269	2 28.099	4	0.011
5	1 19.456	1 29.285	1 39.115	1 48.944	1 58.774	2 8.603	2 18 433	2 28.263	5	0.014
6	1 19.619	1 29.449	1 39.279	1 49.108	1 58.938	2 8.767	2 18.597	2 28.426	6	0.016
7	1 19.783	1 29.613	1 39.442	1 49.272	1 59.101	2 8.931	2 18.761	2 28.590	7	0.019
8	1 19.947	1 29.777	1 39.606	1 49.436	1 59.265	2 9.095	2 18.924	2 28.754	8	0.022
9	1 20.111	1 29.940	1 39.770	1 49.600	1 59.429	2 9.259	2 19.088	2 28.918	9	0.025
10	1 20.275	1 30.104	1 39.934	1 49.763	1 59.593	2 9.423	2 19.252	2 29.082	10	0.027
11	1 20.439	1 30.268	1 40.098	1 49.927	1 59.757	2 9.586	2 19.416	2 29.245	11	0.030
12	1 20.602	1 30.432	1 40.261	1 50.091	1 59.921	2 9.750	2 19.580	2 29.409	12	0.033
13	1 20.766	1 30.596	1 40.425	1 50.255	2 0.084	2 9.914	2 19.744	2 29.573	13	0.035
14	1 20.930	1 30.760	1 40.589	1 50.419	2 0.248	2 10.078	2 19.907	2 29.737	14	0.038
15	1 21.094	1 30.923	1 40.753	1 50.583	2 0.412	2 10.242	2 20.071	2 29.901	15	0.041
16	1 21.258	1 31.087	1 40.917	1 50.746	2 0.576	2 10.405	2 20.235	2 30.065	16	0.044
17	1 21.422	1 31.251	1 41.081	1 50.910	2 0.740	2 10.569	2 20.399	2 30.228	17	0.046
18	1 21.585	1 31.415	1 41.244	1 51.074	2 0.904	2 10.733	2 20.563	2 30.392	18	0.049
19	1 21.749	1 31.579	1 41.408	1 51.238	2 1.067	2 10.897	2 20.727	2 30.556	19	0.052
20	1 21.913	1 31.743	1 41.572	1 51.402	2 1.231	2 11.061	2 20.890	2 30.720	20	0.055
21	1 22.077	1 31.906	1 41.736	1 51.565	2 1.395	2 11.225	2 21.054	2 30.884	21	0.057
22	1 22.241	1 32.070	1 41.900	1 51.729	2 1.559	2 11.388	2 21.218	2 31.048	22	0.060
23	1 22.404	1 32.234	1 42.064	1 51.893	2 1.723	2 11.552	2 21.382	2 31.211	23	0.063
24	1 22.568	1 32.398	1 42.227	1 52.057	2 1.887	2 11.716	2 21.546	2 31.375	24	0.066
25	1 22.732	1 32.562	1 42.391	1 52.221	2 2.050	2 11.880	2 21.709	2 31.539	25	0.068
26	1 22.896	1 32.726	1 42.555	1 52.385	2 2.214	2 12.044	2 21.873	2 31.703	26	0.071
27	1 23.060	1 32.889	1 42.719	1 52.548	2 2.378	2 12.208	2 22.037	2 31.867	27	0.074
28	1 23.224	1 33.053	1 42.883	1 52.712	2 2.542	2 12.371	2 22.201	2 32.031	28	0.076
29	1 23.387	1 33.217	1 43.047	1 52.876	2 2.706	2 12.535	2 22.365	2 32.194	29	0.079
30	1 23.551	1 33.381	1 43.210	1 53.040	2 2.869	2 12.699	2 22.529	2 32.358	30	0.082
31	1 23.715	1 33.545	1 43.374	1 53.204	2 3.033	2 12.863	2 22.692	2 32.522	31	0.085
32	1 23.879	1 33.708	1 43.538	1 53.368	2 3.197	2 13.027	2 22.856	2 32.686	32	0.087
33	1 24.043	1 33.872	1 43.702	1 53.531	2 3.361	2 13.191	2 23.020	2 32.850	33	0.090
34	1 24.207	1 34.036	1 43.866	1 53.695	2 3.525	2 13.354	2 23.184	2 33.013	34	0.093
35	1 24.370	1 34.200	1 44.029	1 53.859	2 3.689	2 13.518	2 23.348	2 33.177	35	0.096
36	1 24.534	1 34.364	1 44.193	1 54.023	2 3.852	2 13.682	2 23.512	2 33.341	36	0.098
37	1 24.698	1 34.528	1 44.357	1 54.187	2 4.016	2 13.846	2 23.675	2 33.505	37	0.101
38	1 24.862	1 34.691	1 44.521	1 54.351	2 4.180	2 14.010	2 23.839	2 33.669	38	0.104
39	1 25.026	1 34.855	1 44.685	1 54.514	2 4.344	2 14.173	2 24.003	2 33.833	39	0.106
40	1 25.190	1 35.019	1 44.849	1 54.678	2 4.508	2 14.337	2 24.167	2 33.996	40	0.109
41	1 25.353	1 35.183	1 45.012	1 54.842	2 4.672	2 14.501	2 24.331	2 34.160	41	0.112
42	1 25.517	1 35.347	1 45.176	1 55.006	2 4.835	2 14.665	2 24.495	2 34.324	42	0.115
43	1 25.681	1 35.511	1 45.340	1 55.170	2 4.999	2 14.829	2 24.658	2 34.488	43	0.117
44	1 25.845	1 35.674	1 45.504	1 55.333	2 5.163	2 14.993	2 24.822	2 34.652	44	0.120
45	1 26.009	1 35.838	1 45.668	1 55.497	2 5.327	2 15.156	2 24.986	2 34.816	45	0.123
46	1 26.172	1 36.002	1 45.832	1 55.661	2 5.491	2 15.320	2 25.150	2 34.979	46	0.126
47	1 26.336	1 36.166	1 45.995	1 55.825	2 5.655	2 15.484	2 25.314	2 35.143	47	0.128
48	1 26.500	1 36.330	1 46.159	1 55.989	2 5.818	2 15.648	2 25.477	2 35.307	48	0.131
49	1 26.664	1 36.493	1 46.323	1 56.153	2 5.982	2 15.812	2 25.641	2 35.471	49	0.134
50	1 26.828	1 36.657	1 46.487	1 56.316	2 6.146	2 15.976	2 25.805	2 35.635	50	0.137
51	1 26.992	1 36.821	1 46.651	1 56.480	2 6.310	2 16.139	2 25.969	2 35.798	51	0.139
52	1 27.155	1 36.985	1 46.815	1 56.644	2 6.474	2 16.303	2 26.133	2 35.962	52	0.142
53	1 27.319	1 37.149	1 46.978	1 56.808	2 6.637	2 16.467	2 26.297	2 36.126	53	0.145
54	1 27.483	1 37.313	1 47.142	1 56.972	2 6.801	2 16.631	2 26.460	2 36.290	54	0.147
55	1 27.647	1 37.476	1 47.306	1 57.136	2 6.965	2 16.795	2 26.624	2 36.454	55	0.150
56	1 27.811	1 37.640	1 47.470	1 57.299	2 7.129	2 16.959	2 26.788	2 36.618	56	0.153
57	1 27.975	1 37.804	1 47.634	1 57.463	2 7.293	2 17.122	2 26.952	2 36.781	57	0.156
58	1 28.138	1 37.968	1 47.797	1 57.627	2 7.457	2 17.286	2 27.116	2 36.945	58	0.158
59	1 28.302	1 38.132	1 47.961	1 57.791	2 7.620	2 17.450	2 27.280	2 37.109	59	[illegible]

TABLE II.

SIDEREAL INTO MEAN SOLAR TIME.

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.

Sidereal.	16^{h}	17^{h}	18^{h}	19^{h}	20^{h}	21^{h}	22^{h}	23^{h}	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	2 37.273	2 47.102	2 56.932	3 6.762	3 16.591	3 26.421	3 36.250	3 46.080	0	0.000
1	2 37.437	2 47.266	2 57.096	3 6.925	3 16.755	3 26.585	3 36.414	3 46.244	1	0.003
2	2 37.601	2 47.430	2 57.260	3 7.089	3 16.919	3 26.748	3 36.578	3 46.407	2	0.005
3	2 37.764	2 47.594	2 57.424	3 7.253	3 17.083	3 26.912	3 36.742	3 46.571	3	0.008
4	2 37.928	2 47.758	2 57.587	3 7.417	3 17.246	3 27.076	3 36.906	3 46.735	4	0.011
5	2 38.092	2 47.922	2 57.751	3 7.581	3 17.410	3 27.240	3 37.069	3 46.899	5	0.014
6	2 38.256	2 48.085	2 57.915	3 7.745	3 17.574	3 27.404	3 37.233	3 47.063	6	0.016
7	2 38.420	2 48.249	2 58.079	3 7.908	3 17.738	3 27.568	3 37.397	3 47.227	7	0.019
8	2 38.584	2 48.413	2 58.243	3 8.072	3 17.902	3 27.731	3 37.561	3 47.390	8	0.022
9	2 38.747	2 48.577	2 58.406	3 8.236	3 18.066	3 27.895	3 37.725	3 47.554	9	0.025
10	2 38.911	2 48.741	2 58.570	3 8.400	3 18.229	3 28.059	3 37.889	3 47.718	10	0.027
11	2 39.075	2 48.905	2 58.734	3 8.564	3 18.393	3 28.223	3 38.052	3 47.882	11	0.030
12	2 39.239	2 49.068	2 58.898	3 8.728	3 18.557	3 28.387	3 38.216	3 48.046	12	0.033
13	2 39.403	2 49.232	2 59.062	3 8.891	3 18.721	3 28.550	3 38.380	3 48.210	13	0.035
14	2 39.566	2 49.396	2 59.226	3 9.055	3 18.885	3 28.714	3 38.544	3 48.373	14	0.038
15	2 39.730	2 49.560	2 59.389	3 9.219	3 19.049	3 28.878	3 38.708	3 48.537	15	0.041
16	2 39.894	2 49.724	2 59.553	3 9.383	3 19.212	3 29.042	3 38.871	3 48.701	16	0.044
17	2 40.058	2 49.888	2 59.717	3 9.547	3 19.376	3 29.206	3 39.035	3 48.865	17	0.046
18	2 40.222	2 50.051	2 59.881	3 9.710	3 19.540	3 29.370	3 39.199	3 49.029	18	0.049
19	2 40.386	2 50.215	3 0.045	3 9.874	3 19.704	3 29.533	3 39.363	3 49.193	19	0.052
20	2 40.549	2 50.379	3 0.209	3 10.038	3 19.868	3 29.697	3 39.527	3 49.356	20	0.055
21	2 40.713	2 50.543	3 0.372	3 10.202	3 20.032	3 29.861	3 39.691	3 49.520	21	0.057
22	2 40.877	2 50.707	3 0.536	3 10.366	3 20.195	3 30.025	3 39.854	3 49.684	22	0.060
23	2 41.041	2 50.870	3 0.700	3 10.530	3 20.359	3 30.189	3 40.018	3 49.848	23	0.063
24	2 41.205	2 51.034	3 0.864	3 10.693	3 20.523	3 30.353	3 40.182	3 50.012	24	0.066
25	2 41.369	2 51.198	3 1.028	3 10.857	3 20.687	3 30.516	3 40.346	3 50.175	25	0.068
26	2 41.532	2 51.362	3 1.192	3 11.021	3 20.851	3 30.680	3 40.510	3 50.339	26	0.071
27	2 41.696	2 51.526	3 1.355	3 11.185	3 21.014	3 30.844	3 40.674	3 50.503	27	0.074
28	2 41.860	2 51.690	3 1.519	3 11.349	3 21.178	3 31.008	3 40.837	3 50.667	28	0.076
29	2 42.024	2 51.853	3 1.683	3 11.513	3 21.342	3 31.172	3 41.001	3 50.831	29	0.079
30	2 42.188	2 52.017	3 1.847	3 11.676	3 21.506	3 31.336	3 41.165	3 50.995	30	0.082
31	2 42.352	2 52.181	3 2.011	3 11.840	3 21.670	3 31.499	3 41.329	3 51.158	31	0.085
32	2 42.515	2 52.345	3 2.174	3 12.004	3 21.834	3 31.663	3 41.493	3 51.322	32	0.087
33	2 42.679	2 52.509	3 2.338	3 12.168	3 21.997	3 31.827	3 41.657	3 51.486	33	0.090
34	2 42.843	2 52.673	3 2.502	3 12.332	3 22.161	3 31.991	3 41.820	3 51.650	34	0.093
35	2 43.007	2 52.836	3 2.666	3 12.496	3 22.325	3 32.155	3 41.984	3 51.814	35	0.096
36	2 43.171	2 53.000	3 2.830	3 12.659	3 22.489	3 32.318	3 42.148	3 51.978	36	0.098
37	2 43.334	2 53.164	3 2.994	3 12.823	3 22.653	3 32.482	3 42.312	3 52.141	37	0.101
38	2 43.498	2 53.328	3 3.157	3 12.987	3 22.817	3 32.646	3 42.476	3 52.305	38	0.104
39	2 43.662	2 53.492	3 3.321	3 13.151	3 22.980	3 32.810	3 42.639	3 52.469	39	0.106
40	2 43.826	2 53.656	3 3.485	3 13.315	3 23.144	3 32.974	3 42.803	3 52.633	40	0.109
41	2 43.990	2 53.819	3 3.649	3 13.478	3 23.308	3 33.138	3 42.967	3 52.797	41	0.112
42	2 44.154	2 53.983	3 3.813	3 13.642	3 23.472	3 33.301	3 43.131	3 52.961	42	0.115
43	2 44.317	2 54.147	3 3.977	3 13.806	3 23.636	3 33.465	3 43.295	3 53.124	43	0.117
44	2 44.481	2 54.311	3 4.140	3 13.970	3 23.800	3 33.629	3 43.459	3 53.288	44	0.120
45	2 44.645	2 54.475	3 4.304	3 14.134	3 23.963	3 33.793	3 43.622	3 53.452	45	0.123
46	2 44.809	2 54.638	3 4.468	3 14.298	3 24.127	3 33.957	3 43.786	3 53.616	46	0.126
47	2 44.973	2 54.802	3 4.632	3 14.461	3 24.291	3 34.121	3 43.950	3 53.780	47	0.128
48	2 45.137	2 54.966	3 4.796	3 14.625	3 24.455	3 34.284	3 44.114	3 53.943	48	0.131
49	2 45.300	2 55.130	3 4.960	3 14.789	3 24.619	3 34.448	3 44.278	3 54.107	49	0.134
50	2 45.464	2 55.294	3 5.123	3 14.953	3 24.782	3 34.612	3 44.442	3 54.271	50	0.137
51	2 45.628	2 55.458	3 5.287	3 15.117	3 24.946	3 34.776	3 44.605	3 54.435	51	0.139
52	2 45.792	2 55.621	3 5.451	3 15.281	3 25.110	3 34.940	3 44.769	3 54.599	52	0.142
53	2 45.956	2 55.785	3 5.615	3 15.444	3 25.274	3 35.104	3 44.933	3 54.763	53	0.145
54	2 46.120	2 55.949	3 5.779	3 15.608	3 25.438	3 35.267	3 45.097	3 54.926	54	0.147
55	2 46.283	2 56.113	3 5.942	3 15.772	3 25.602	3 35.431	3 45.261	3 55.090	55	0.150
56	2 46.447	2 56.277	3 6.106	3 15.936	3 25.765	3 35.595	3 45.425	3 55.254	56	0.153
57	2 46.611	2 56.441	3 6.270	3 16.100	3 25.929	3 35.759	3 45.588	3 55.418	57	0.156
58	2 46.775	2 56.604	3 6.434	3 16.264	3 26.093	3 35.923	3 45.752	3 55.582	58	0.158
59	2 46.939	2 56.768	3 6.598	3 16.427	3 26.257	3 36.086	3 45.916	3 55.746	59	0.161

MEAN SOLAR INTO SIDEREAL TIME.

TO BE ADDED TO A MEAN TIME INTERVAL.

Mean Solar.	0^h	1^h	2^h	3^h	4^h	5^h	6^h	7^h	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	0 0.000	0 9.856	0 19.713	0 29.569	0 39.426	0 49.282	0 59.139	1 8.995	0	0.000
1	0 0.164	0 10.021	0 19.877	0 29.734	0 39.590	0 49.447	0 59.303	1 9.160	1	0.003
2	0 0.329	0 10.185	0 20.041	0 29.898	0 39.754	0 49.611	0 59.467	1 9.324	2	0.005
3	0 0.493	0 10.349	0 20.206	0 30.062	0 39.919	0 49.775	0 59.632	1 9.488	3	0.008
4	0 0.657	0 10.514	0 20.370	0 30.227	0 40.083	0 49.939	0 59.796	1 9.652	4	0.011
5	0 0.821	0 10.678	0 20.534	0 30.391	0 40.247	0 50.104	0 59.960	1 9.817	5	0.014
6	0 0.986	0 10.842	0 20.699	0 30.555	0 40.412	0 50.268	1 0.124	1 9.981	6	0.016
7	0 1.150	0 11.006	0 20.863	0 30.719	0 40.576	0 50.432	1 0.289	1 10.145	7	0.019
8	0 1.314	0 11.171	0 21.027	0 30.884	0 40.740	0 50.597	1 0.453	1 10.310	8	0.022
9	0 1.478	0 11.335	0 21.191	0 31.048	0 40.904	0 50.761	1 0.617	1 10.474	9	0.025
10	0 1.643	0 11.499	0 21.356	0 31.212	0 41.069	0 50.925	1 0.782	1 10.638	10	0.027
11	0 1.807	0 11.663	0 21.520	0 31.376	0 41.233	0 51.089	1 0.946	1 10.802	11	0.030
12	0 1.971	0 11.828	0 21.684	0 31.541	0 41.397	0 51.254	1 1.110	1 10.967	12	0.033
13	0 2.136	0 11.992	0 21.849	0 31.705	0 41.561	0 51.418	1 1.274	1 11.131	13	0.036
14	0 2.300	0 12.156	0 22.013	0 31.869	0 41.726	0 51.582	1 1.439	1 11.295	14	0.038
15	0 2.464	0 12.321	0 22.177	0 32.034	0 41.890	0 51.746	1 1.603	1 11.459	15	0.041
16	0 2.628	0 12.485	0 22.341	0 32.198	0 42.054	0 51.911	1 1.767	1 11.624	16	0.044
17	0 2.793	0 12.649	0 22.506	0 32.362	0 42.219	0 52.075	1 1.932	1 11.788	17	0.047
18	0 2.957	0 12.813	0 22.670	0 32.526	0 42.383	0 52.239	1 2.096	1 11.952	18	0.049
19	0 3.121	0 12.978	0 22.834	0 32.691	0 42.547	0 52.404	1 2.260	1 12.117	19	0.052
20	0 3.285	0 13.142	0 22.998	0 32.855	0 42.711	0 52.568	1 2.424	1 12.281	20	0.055
21	0 3.450	0 13.306	0 23.163	0 33.019	0 42.876	0 52.732	1 2.589	1 12.445	21	0.057
22	0 3.614	0 13.471	0 23.327	0 33.183	0 43.040	0 52.896	1 2.753	1 12.609	22	0.060
23	0 3.778	0 13.635	0 23.491	0 33.348	0 43.204	0 53.061	1 2.917	1 12.774	23	0.063
24	0 3.943	0 13.799	0 23.656	0 33.512	0 43.368	0 53.225	1 3.081	1 12.938	24	0.066
25	0 4.107	0 13.963	0 23.820	0 33.676	0 43.533	0 53.389	1 3.246	1 13.102	25	0.068
26	0 4.271	0 14.128	0 23.984	0 33.841	0 43.697	0 53.554	1 3.410	1 13.266	26	0.071
27	0 4.435	0 14.292	0 24.148	0 34.005	0 43.861	0 53.718	1 3.574	1 13.431	27	0.074
28	0 4.600	0 14.456	0 24.313	0 34.169	0 44.026	0 53.882	1 3.739	1 13.595	28	0.077
29	0 4.764	0 14.620	0 24.477	0 34.333	0 44.190	0 54.046	1 3.903	1 13.759	29	0.079
30	0 4.928	0 14.785	0 24.641	0 34.498	0 44.354	0 54.211	1 4.067	1 13.924	30	0.082
31	0 5.093	0 14.949	0 24.805	0 34.662	0 44.518	0 54.375	1 4.231	1 14.088	31	0.085
32	0 5.257	0 15.113	0 24.970	0 34.826	0 44.683	0 54.539	1 4.396	1 14.252	32	0.088
33	0 5.421	0 15.278	0 25.134	0 34.990	0 44.847	0 54.703	1 4.560	1 14.416	33	0.090
34	0 5.585	0 15.442	0 25.298	0 35.155	0 45.011	0 54.868	1 4.724	1 14.581	34	0.093
35	0 5.750	0 15.606	0 25.463	0 35.319	0 45.176	0 55.032	1 4.888	1 14.745	35	0.096
36	0 5.914	0 15.770	0 25.627	0 35.483	0 45.340	0 55.196	1 5.053	1 14.909	36	0.099
37	0 6.078	0 15.935	0 25.791	0 35.648	0 45.504	0 55.361	1 5.217	1 15.073	37	0.101
38	0 6.242	0 16.099	0 25.955	0 35.812	0 45.668	0 55.525	1 5.381	1 15.238	38	0.104
39	0 6.407	0 16.263	0 26.120	0 35.976	0 45.833	0 55.689	1 5.546	1 15.402	39	0.107
40	0 6.571	0 16.427	0 26.284	0 36.140	0 45.997	0 55.853	1 5.710	1 15.566	40	0.110
41	0 6.735	0 16.592	0 26.448	0 36.305	0 46.161	0 56.018	1 5.874	1 15.731	41	0.112
42	0 6.900	0 16.756	0 26.612	0 36.469	0 46.325	0 56.182	1 6.038	1 15.895	42	0.115
43	0 7.064	0 16.920	0 26.777	0 36.633	0 46.490	0 56.346	1 6.203	1 16.059	43	0.118
44	0 7.228	0 17.085	0 26.941	0 36.798	0 46.654	0 56.510	1 6.367	1 16.223	44	0.120
45	0 7.392	0 17.249	0 27.105	0 36.962	0 46.818	0 56.675	1 6.531	1 16.388	45	0.123
46	0 7.557	0 17.413	0 27.270	0 37.126	0 46.983	0 56.839	1 6.695	1 16.552	46	0.126
47	0 7.721	0 17.577	0 27.434	0 37.290	0 47.147	0 57.003	1 6.860	1 16.716	47	0.129
48	0 7.885	0 17.742	0 27.598	0 37.455	0 47.311	0 57.168	1 7.024	1 16.881	48	0.131
49	0 8.049	0 17.906	0 27.762	0 37.619	0 47.475	0 57.332	1 7.188	1 17.045	49	0.134
50	0 8.214	0 18.070	0 27.927	0 37.783	0 47.640	0 57.496	1 7.353	1 17.209	50	0.137
51	0 8.378	0 18.234	0 28.091	0 37.947	0 47.804	0 57.660	1 7.517	1 17.373	51	0.140
52	0 8.542	0 18.399	0 28.255	0 38.112	0 47.968	0 57.825	1 7.681	1 17.538	52	0.142
53	0 8.707	0 18.563	0 28.420	0 38.276	0 48.132	0 57.989	1 7.845	1 17.702	53	0.145
54	0 8.871	0 18.727	0 28.584	0 38.440	0 48.297	0 58.153	1 8.010	1 17.866	54	0.148
55	0 9.035	0 18.892	0 28.748	0 38.605	0 48.461	0 58.317	1 8.174	1 18.030	55	0.151
56	0 9.199	0 19.056	0 28.912	0 38.769	0 48.625	0 58.482	1 8.338	1 18.195	56	0.153
57	0 9.364	0 19.220	0 29.077	0 38.933	0 48.790	0 58.646	1 8.502	1 18.359	57	0.156
58	0 9.528	0 19.384	0 29.241	0 39.097	0 48.954	0 58.810	1 8.667	1 18.523	58	0.159
59	0 9.692	0 19.549	0 29.405	0 39.262	0 49.118	0 58.975	1 8.831	1 18.688	59	0.162

TABLE III.

MEAN SOLAR INTO SIDEREAL TIME.

TO BE ADDED TO A MEAN TIME INTERVAL.

Mean Solar.	8^{h}	9^{h}	10^{h}	11^{h}	12^{h}	13^{h}	14^{h}	15^{h}	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	1 18.852	1 28.708	1 38.565	1 48.421	1 58.278	2 8.134	2 17.991	2 27.847	0	0.000
1	1 19.016	1 28.873	1 38.729	1 48.585	1 58.442	2 8.298	2 18.155	2 28.011	1	0.003
2	1 19.180	1 29.037	1 38.893	1 48.750	1 58.606	2 8.463	2 18.319	2 28.176	2	0.005
3	1 19.345	1 29.201	1 39.058	1 48.914	1 58.771	2 8.627	2 18.483	2 28.340	3	0.008
4	1 19.509	1 29.365	1 39.222	1 49.078	1 58.935	2 8.791	2 18.648	2 28.504	4	0.011
5	1 19.673	1 29.530	1 39.386	1 49.243	1 59.099	2 8.956	2 18.812	2 28.668	5	0.014
6	1 19.837	1 29.694	1 39.550	1 49.407	1 59.263	2 9.120	2 18.976	2 28.833	6	0.016
7	1 20.002	1 29.858	1 39.715	1 49.571	1 59.428	2 9.284	2 19.141	2 28.997	7	0.019
8	1 20.166	1 30.022	1 39.879	1 49.735	1 59.592	2 9.448	2 19.305	2 29.161	8	0.022
9	1 20.330	1 30.187	1 40.043	1 49.900	1 59.756	2 9.613	2 19.469	2 29.326	9	0.025
10	1 20.495	1 30.351	1 40.207	1 50.064	1 59.920	2 9.777	2 19.633	2 29.490	10	0.027
11	1 20.659	1 30.515	1 40.372	1 50.228	2 0.085	2 9.941	2 19.798	2 29.654	11	0.030
12	1 20.823	1 30.680	1 40.536	1 50.393	2 0.249	2 10.105	2 19.962	2 29.818	12	0.033
13	1 20.987	1 30.844	1 40.700	1 50.557	2 0.413	2 10.270	2 20.126	2 29.983	13	0.036
14	1 21.152	1 31.008	1 40.865	1 50.721	2 0.578	2 10.434	2 20.290	2 30.147	14	0.038
15	1 21.316	1 31.172	1 41.029	1 50.885	2 0.742	2 10.598	2 20.455	2 30.311	15	0.041
16	1 21.480	1 31.337	1 41.193	1 51.050	2 0.906	2 10.763	2 20.619	2 30.476	16	0.044
17	1 21.644	1 31.501	1 41.357	1 51.214	2 1.070	2 10.927	2 20.783	2 30.640	17	0.047
18	1 21.809	1 31.665	1 41.522	1 51.378	2 1.235	2 11.091	2 20.948	2 30.804	18	0.049
19	1 21.973	1 31.829	1 41.686	1 51.542	2 1.399	2 11.255	2 21.112	2 30.968	19	0.052
20	1 22.137	1 31.994	1 41.850	1 51.707	2 1.563	2 11.420	2 21.276	2 31.133	20	0.055
21	1 22.302	1 32.158	1 42.015	1 51.871	2 1.727	2 11.584	2 21.440	2 31.297	21	0.057
22	1 22.466	1 32.322	1 42.179	1 52.035	2 1.892	2 11.748	2 21.605	2 31.461	22	0.060
23	1 22.630	1 32.487	1 42.343	1 52.200	2 2.056	2 11.912	2 21.769	2 31.625	23	0.063
24	1 22.794	1 32.651	1 42.507	1 52.364	2 2.220	2 12.077	2 21.933	2 31.790	24	0.066
25	1 22.959	1 32.815	1 42.672	1 52.528	2 2.385	2 12.241	2 22.098	2 31.954	25	0.068
26	1 23.123	1 32.979	1 42.836	1 52.692	2 2.549	2 12.405	2 22.262	2 32.118	26	0.071
27	1 23.287	1 33.144	1 43.000	1 52.857	2 2.713	2 12.570	2 22.426	2 32.283	27	0.074
28	1 23.451	1 33.308	1 43.164	1 53.021	2 2.877	2 12.734	2 22.590	2 32.447	28	0.077
29	1 23.616	1 33.472	1 43.329	1 53.185	2 3.042	2 12.898	2 22.755	2 32.611	29	0.079
30	1 23.780	1 33.637	1 43.493	1 53.349	2 3.206	2 13.062	2 22.919	2 32.775	30	0.082
31	1 23.944	1 33.801	1 43.657	1 53.514	2 3.370	2 13.227	2 23.083	2 32.940	31	0.085
32	1 24.109	1 33.965	1 43.822	1 53.678	2 3.534	2 13.391	2 23.247	2 33.104	32	0.088
33	1 24.273	1 34.129	1 43.986	1 53.842	2 3.699	2 13.555	2 23.412	2 33.268	33	0.090
34	1 24.437	1 34.294	1 44.150	1 54.007	2 3.863	2 13.720	2 23.576	2 33.432	34	0.093
35	1 24.601	1 34.458	1 44.314	1 54.171	2 4.027	2 13.884	2 23.740	2 33.597	35	0.096
36	1 24.766	1 34.622	1 44.479	1 54.335	2 4.192	2 14.048	2 23.905	2 33.761	36	0.099
37	1 24.930	1 34.786	1 44.643	1 54.499	2 4.356	2 14.212	2 24.069	2 33.925	37	0.101
38	1 25.094	1 34.951	1 44.807	1 54.664	2 4.520	2 14.377	2 24.233	2 34.090	38	0.104
39	1 25.259	1 35.115	1 44.971	1 54.828	2 4.684	2 14.541	2 24.397	2 34.254	39	0.107
40	1 25.423	1 35.279	1 45.136	1 54.992	2 4.849	2 14.705	2 24.562	2 34.418	40	0.110
41	1 25.587	1 35.444	1 45.300	1 55.156	2 5.013	2 14.869	2 24.726	2 34.582	41	0.112
42	1 25.751	1 35.608	1 45.464	1 55.321	2 5.177	2 15.034	2 24.890	2 34.747	42	0.115
43	1 25.916	1 35.772	1 45.629	1 55.485	2 5.342	2 15.198	2 25.054	2 34.911	43	0.118
44	1 26.080	1 35.936	1 45.793	1 55.649	2 5.506	2 15.362	2 25.219	2 35.075	44	0.120
45	1 26.244	1 36.101	1 45.957	1 55.814	2 5.670	2 15.527	2 25.383	2 35.239	45	0.123
46	1 26.408	1 36.265	1 46.121	1 55.978	2 5.834	2 15.691	2 25.547	2 35.404	46	0.126
47	1 26.573	1 36.429	1 46.286	1 56.142	2 5.999	2 15.855	2 25.712	2 35.568	47	0.129
48	1 26.737	1 36.593	1 46.450	1 56.306	2 6.163	2 16.019	2 25.876	2 35.732	48	0.131
49	1 26.901	1 36.758	1 46.614	1 56.471	2 6.327	2 16.184	2 26.040	2 35.897	49	0.134
50	1 27.066	1 36.922	1 46.778	1 56.635	2 6.491	2 16.348	2 26.204	2 36.061	50	0.137
51	1 27.230	1 37.086	1 46.943	1 56.799	2 6.656	2 16.512	2 26.369	2 36.225	51	0.140
52	1 27.394	1 37.251	1 47.107	1 56.964	2 6.820	2 16.676	2 26.533	2 36.389	52	0.142
53	1 27.558	1 37.415	1 47.271	1 57.128	2 6.984	2 16.841	2 26.697	2 36.554	53	0.145
54	1 27.723	1 37.579	1 47.436	1 57.292	2 7.149	2 17.005	2 26.861	2 36.718	54	0.148
55	1 27.887	1 37.743	1 47.600	1 57.456	2 7.313	2 17.169	2 27.026	2 36.882	55	0.151
56	1 28.051	1 37.908	1 47.764	1 57.621	2 7.477	2 17.334	2 27.190	2 37.047	56	0.153
57	1 28.215	1 38.072	1 47.928	1 57.785	2 7.641	2 17.498	2 27.354	2 37.211	57	0.156
58	1 28.380	1 38.236	1 48.093	1 57.949	2 7.806	2 17.662	2 27.519	2 37.375	58	0.159
59	1 28.544	1 38.400	1 48.257	1 58.113	2 7.970	2 17.826	2 27.683	2 37.539	59	0.162

TABLE III.

MEAN SOLAR INTO SIDEREAL TIME.

TO BE ADDED TO A MEAN TIME INTERVAL.

Mean Solar.	16h	17h	18h	19h	20h	21h	22h	23h	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	2 37.704	2 47.560	2 57.417	3 7.273	3 17.129	3 26.986	3 36.842	3 46.699	0	0.000
1	2 37.868	2 47.724	2 57.581	3 7.437	3 17.294	3 27.150	3 37.007	3 46.863	1	0.003
2	2 38.032	2 47.889	2 57.745	3 7.602	3 17.458	3 27.315	3 37.171	3 47.027	2	0.005
3	2 38.196	2 48.053	2 57.909	3 7.766	3 17.622	3 27.479	3 37.335	3 47.192	3	0.008
4	2 38.361	2 48.217	2 58.074	3 7.930	3 17.787	3 27.643	3 37.500	3 47.356	4	0.011
5	2 38.525	2 48.381	2 58.238	3 8.094	3 17.951	3 27.807	3 37.664	3 47.520	5	0.014
6	2 38.689	2 48.546	2 58.402	3 8.259	3 18.115	3 27.972	3 37.828	3 47.685	6	0.016
7	2 38.854	2 48.710	2 58.566	3 8.423	3 18.279	3 28.136	3 37.992	3 47.849	7	0.019
8	2 39.018	2 48.874	2 58.731	3 8.587	3 18.444	3 28.300	3 38.157	3 48.013	8	0.022
9	2 39.182	2 49.039	2 58.895	3 8.751	3 18.608	3 28.464	3 38.321	3 48.177	9	0.025
10	2 39.346	2 49.203	2 59.059	3 8.916	3 18.772	3 28.629	3 38.485	3 48.342	10	0.027
11	2 39.511	2 49.367	2 59.224	3 9.080	3 18.937	3 28.793	3 38.649	3 48.506	11	0.030
12	2 39.675	2 49.531	2 59.388	3 9.244	3 19.101	3 28.957	3 38.814	3 48.670	12	0.033
13	2 39.839	2 49.696	2 59.552	3 9.409	3 19.265	3 29.122	3 38.978	3 48.834	13	0.036
14	2 40.003	2 49.860	2 59.716	3 9.573	3 19.429	3 29.286	3 39.142	3 48.999	14	0.038
15	2 40.168	2 50.024	2 59.881	3 9.737	3 19.594	3 29.450	3 39.307	3 49.163	15	0.041
16	2 40.332	2 50.188	3 0.045	3 9.901	3 19.758	3 29.614	3 39.471	3 49.327	16	0.044
17	2 40.496	2 50.353	3 0.209	3 10.066	3 19.922	3 29.779	3 39.635	3 49.492	17	0.047
18	2 40.661	2 50.517	3 0.373	3 10.230	3 20.086	3 29.943	3 39.799	3 49.656	18	0.049
19	2 40.825	2 50.681	3 0.538	3 10.394	3 20.251	3 30.107	3 39.964	3 49.820	19	0.052
20	2 40.989	2 50.846	3 0.702	3 10.559	3 20.415	3 30.271	3 40.128	3 49.984	20	0.055
21	2 41.153	2 51.010	3 0.866	3 10.723	3 20.579	3 30.436	3 40.292	3 50.149	21	0.057
22	2 41.318	2 51.174	3 1.031	3 10.887	3 20.744	3 30.600	3 40.456	3 50.313	22	0.060
23	2 41.482	2 51.338	3 1.195	3 11.051	3 20.908	3 30.764	3 40.621	3 50.477	23	0.063
24	2 41.646	2 51.503	3 1.359	3 11.216	3 21.072	3 30.929	3 40.785	3 50.642	24	0.066
25	2 41.810	2 51.667	3 1.523	3 11.380	3 21.236	3 31.093	3 40.949	3 50.806	25	0.068
26	2 41.975	2 51.831	3 1.688	3 11.544	3 21.401	3 31.257	3 41.114	3 50.970	26	0.071
27	2 42.139	2 51.995	3 1.852	3 11.708	3 21.565	3 31.421	3 41.278	3 51.134	27	0.074
28	2 42.303	2 52.160	3 2.016	3 11.873	3 21.729	3 31.586	3 41.442	3 51.299	28	0.077
29	2 42.468	2 52.324	3 2.181	3 12.037	3 21.893	3 31.750	3 41.606	3 51.463	29	0.079
30	2 42.632	2 52.488	3 2.345	3 12.201	3 22.058	3 31.914	3 41.771	3 51.627	30	0.082
31	2 42.796	2 52.653	3 2.509	3 12.366	3 22.222	3 32.078	3 41.935	3 51.791	31	0.085
32	2 42.960	2 52.817	3 2.673	3 12.530	3 22.386	3 32.243	3 42.099	3 51.956	32	0.088
33	2 43.125	2 52.981	3 2.838	3 12.694	3 22.551	3 32.407	3 42.264	3 52.120	33	0.090
34	2 43.289	2 53.145	3 3.002	3 12.858	3 22.715	3 32.571	3 42.428	3 52.284	34	0.093
35	2 43.453	2 53.310	3 3.166	3 13.023	3 22.879	3 32.736	3 42.592	3 52.449	35	0.096
36	2 43.617	2 53.474	3 3.330	3 13.187	3 23.043	3 32.900	3 42.756	3 52.613	36	0.099
37	2 43.782	2 53.638	3 3.495	3 13.351	3 23.208	3 33.064	3 42.921	3 52.777	37	0.101
38	2 43.946	2 53.803	3 3.659	3 13.515	3 23.372	3 33.228	3 43.085	3 52.941	38	0.104
39	2 44.110	2 53.967	3 3.823	3 13.680	3 23.536	3 33.393	3 43.249	3 53.106	39	0.107
40	2 44.275	2 54.131	3 3.988	3 13.844	3 23.700	3 33.557	3 43.413	3 53.270	40	0.110
41	2 44.439	2 54.295	3 4.152	3 14.008	3 23.865	3 33.721	3 43.578	3 53.434	41	0.112
42	2 44.603	2 54.460	3 4.316	3 14.173	3 24.029	3 33.886	3 43.742	3 53.598	42	0.115
43	2 44.767	2 54.624	3 4.480	3 14.337	3 24.193	3 34.050	3 43.906	3 53.763	43	0.118
44	2 44.932	2 54.788	3 4.645	3 14.501	3 24.358	3 34.214	3 44.071	3 53.927	44	0.120
45	2 45.096	2 54.952	3 4.809	3 14.665	3 24.522	3 34.378	3 44.235	3 54.091	45	0.123
46	2 45.260	2 55.117	3 4.973	3 14.830	3 24.686	3 34.543	3 44.399	3 54.256	46	0.126
47	2 45.425	2 55.281	3 5.137	3 14.994	3 24.850	3 34.707	3 44.563	3 54.420	47	0.129
48	2 45.589	2 55.445	3 5.302	3 15.158	3 25.015	3 34.871	3 44.728	3 54.584	48	0.131
49	2 45.753	2 55.610	3 5.466	3 15.322	3 25.179	3 35.035	3 44.892	3 54.748	49	0.134
50	2 45.917	2 55.774	3 5.630	3 15.487	3 25.343	3 35.200	3 45.056	3 54.913	50	0.137
51	2 46.082	2 55 938	3 5.795	3 15.651	3 25.508	3 35.364	3 45.220	3 55.077	51	0.140
52	2 46.246	2 56.102	3 5.959	3 15.815	3 25.672	3 35.528	3 45.385	3 55.241	52	0.142
53	2 46.410	2 56.267	3 6.123	3 15.980	3 25.836	3 35.693	3 45.549	3 55.405	53	0.145
54	2 46.574	2 56.431	3 6.287	3 16.144	3 26.000	3 35.857	3 45.713	3 55.570	54	0.148
55	2 46.739	2 56.595	3 6.452	3 16.308	3 26.165	3 36.021	3 45.878	3 55.734	55	0.151
56	2 46.903	2 56.759	3 6.616	3 16.472	3 26.329	3 36.185	3 46.042	3 55.898	56	0.153
57	2 47.067	2 56.924	3 6.780	3 16.637	3 26.493	3 36.350	3 46.206	3 56.063	57	0.156
58	2 47.232	2 57.088	3 6.944	3 16.801	3 26.657	3 36.514	3 46.370	3 56.227	58	0.159
59	2 47.396	2 57.252	3 7.109	3 16.965	3 26.822	3 36.678	3 46.535	3 56.391	59	0.162

AZIMUTH OF POLARIS AT ALL HOUR ANGLES, 1916.

[For hour angles 0ʰ to 12ʰ the star is west of north, and for hour angles 12ʰ to 24ʰ it is east of north.]

Lat. / H. A.	10°	15°	20°	22°	24°	26°	28°	30°	32°	Lat. / H. A.
h m	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	h m
0 0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	24 0
10	0 3.0	0 3.1	0 3.2	0 3.2	0 3.3	0 3.4	0 3.4	0 3.5	0 3.6	23 50
20	0 6.1	0 6.2	0 6.4	0 6.5	0 6.6	0 6.7	0 6.8	0 7.0	0 7.1	40
0 30	0 9.1	0 9.3	0 9.6	0 9.7	0 9.8	0 10.0	0 10.2	0 10.4	0 10.6	23 30
40	0 12.1	0 12.3	0 12.7	0 12.9	0 13.1	0 13.3	0 13.6	0 13.8	0 14.1	20
50	0 15.1	0 15.4	0 15.8	0 16.1	0 16.3	0 16.6	0 16.9	0 17.2	0 17.6	10
1 0	0 18.0	0 18.4	0 18.9	0 19.2	0 19.5	0 19.8	0 20.2	0 20.6	0 21.1	23 0
10	0 20.9	0 21.4	0 22.0	0 22.3	0 22.7	0 23.0	0 23.5	0 24.0	0 24.5	22 50
20	0 23.8	0 24.3	0 25.0	0 25.4	0 25.8	0 26.2	0 26.7	0 27.3	0 27.9	40
1 30	0 26.6	0 27.2	0 28.0	0 28.4	0 28.8	0 29.3	0 29.9	0 30.5	0 31.2	22 30
40	0 29.4	0 30.0	0 30.9	0 31.3	0 31.8	0 32.4	0 33.0	0 33.7	0 34.4	20
50	0 32.1	0 32.8	0 33.7	0 34.2	0 34.8	0 35.4	0 36.0	0 36.8	0 37.6	10
2 0	0 34.8	0 35.5	0 36.5	0 37.1	0 37.6	0 38.3	0 39.0	0 39.8	0 40.7	22 0
10	0 37.4	0 38.1	0 39.3	0 39.8	0 40.4	0 41.1	0 41.9	0 42.8	0 43.7	21 50
20	0 39.9	0 40.7	0 41.9	0 42.5	0 43.2	0 43.9	0 44.7	0 45.6	0 46.6	40
2 30	0 42.3	0 43.2	0 44.5	0 45.1	0 45.8	0 46.6	0 47.4	0 48.4	0 49.5	21 30
40	0 44.7	0 45.6	0 46.9	0 47.6	0 48.3	0 49.2	0 50.1	0 51.1	0 52.2	20
50	0 46.9	0 47.9	0 49.3	0 50.0	0 50.8	0 51.7	0 52.6	0 53.7	0 54.9	10
3 0	0 49.1	0 50.2	0 51.6	0 52.3	0 53.2	0 54.1	0 55.1	0 56.2	0 57.4	21 0
10	0 51.2	0 52.3	0 53.8	0 54.6	0 55.4	0 56.4	0 57.4	0 58.5	0 59.8	20 50
20	0 53.2	0 54.3	0 55.9	0 56.7	0 57.6	0 58.5	0 59.6	1 0.8	1 2.1	40
3 30	0 55.1	0 56.2	0 57.9	0 58.7	0 59.6	1 0.6	1 1.7	1 3.0	1 4.3	20 30
40	0 56.9	0 58.1	0 59.7	1 0.6	1 1.5	1 2.6	1 3.7	1 5.0	1 6.4	20
50	0 58.6	0 59.8	1 1.5	1 2.4	1 3.3	1 4.4	1 5.6	1 6.9	1 8.3	10
4 0	1 0.1	1 1.4	1 3.1	1 4.0	1 5.0	1 6.1	1 7.3	1 8.6	1 10.1	20 0
10	1 1.6	1 2.8	1 4.6	1 5.5	1 6.5	1 7.7	1 8.9	1 10.3	1 11.8	19 50
20	1 2.9	1 4.2	1 6.0	1 6.9	1 8.0	1 9.1	1 10.4	1 11.8	1 13.3	40
4 30	1 4.1	1 5.4	1 7.3	1 8.2	1 9.3	1 10.4	1 11.7	1 13.1	1 14.7	19 30
40	1 5.2	1 6.5	1 8.4	1 9.4	1 10.4	1 11.6	1 12.9	1 14.3	1 15.9	20
50	1 6.2	1 7.5	1 9.4	1 10.4	1 11.4	1 12.6	1 14.0	1 15.4	1 17.0	10
5 0	1 7.0	1 8.3	1 10.3	1 11.3	1 12.3	1 13.5	1 14.9	1 16.3	1 18.0	19 0
10	1 7.7	1 9.1	1 11.0	1 12.0	1 13.1	1 14.3	1 15.6	1 17.1	1 18.8	18 50
20	1 8.3	1 9.7	1 11.6	1 12.6	1 13.7	1 14.9	1 16.3	1 17.8	1 19.4	40
5 30	1 8.7	1 10.1	1 12.1	1 13.1	1 14.2	1 15.4	1 16.7	1 18.3	1 19.9	18 30
40	1 9.1	1 10.4	1 12.4	1 13.4	1 14.5	1 15.7	1 17.1	1 18.6	1 20.3	20
50	1 9.3	1 10.6	1 12.6	1 13.6	1 14.7	1 15.9	1 17.3	1 18.8	1 20.5	10
6 0	1 9.3	1 10.7	1 12.6	1 13.6	1 14.7	1 15.9	1 17.3	1 18.8	1 20.5	18 0
10	1 9.2	1 10.6	1 12.5	1 13.5	1 14.6	1 15.8	1 17.2	1 18.7	1 20.4	17 50
20	1 9.0	1 10.4	1 12.3	1 13.3	1 14.4	1 15.6	1 16.9	1 18.4	1 20.1	40
6 30	1 8.7	1 10.0	1 11.9	1 12.9	1 14.0	1 15.2	1 16.5	1 18.0	1 19.7	17 30
40	1 8.2	1 9.5	1 11.4	1 12.4	1 13.5	1 14.7	1 16.0	1 17.5	1 19.1	20
50	1 7.6	1 8.9	1 10.8	1 11.7	1 12.8	1 14.0	1 15.3	1 16.8	1 18.4	10
7 0	1 6.9	1 8.2	1 10.0	1 10.9	1 12.0	1 13.2	1 14.5	1 15.9	1 17.5	17 0
10	1 6.0	1 7.3	1 9.1	1 10.0	1 11.1	1 12.2	1 13.5	1 14.9	1 16.5	16 50
20	1 5.0	1 6.3	1 8.1	1 9.0	1 10.0	1 11.1	1 12.4	1 13.8	1 15.3	40
7 30	1 3.9	1 5.2	1 6.9	1 7.8	1 8.8	1 9.9	1 11.1	1 12.5	1 14.0	16 30
40	1 2.7	1 3.9	1 5.6	1 6.5	1 7.5	1 8.5	1 9.7	1 11.1	1 12.6	20
50	1 1.4	1 2.5	1 4.2	1 5.1	1 6.0	1 7.0	1 8.2	1 9.5	1 11.0	10
8 0	0 59.9	1 1.0	1 2.7	1 3.5	1 4.4	1 5.4	1 6.6	1 7.9	1 9.3	16 0
10	0 58.3	0 59.4	1 1.0	1 1.8	1 2.7	1 3.7	1 4.8	1 6.1	1 7.4	15 50
20	0 56.7	0 57.7	0 59.2	1 0.0	1 0.9	1 1.9	1 2.9	1 4.1	1 5.5	40
8 30	0 54.9	0 55.9	0 57.4	0 58.1	0 59.0	0 59.9	1 0.9	1 2.1	1 3.4	15 30
40	0 53.0	0 53.9	0 55.4	0 56.1	0 56.9	0 57.8	0 58.8	0 59.9	1 1.2	20
50	0 51.0	0 51.9	0 53.3	0 54.0	0 54.7	0 55.6	0 56.6	0 57.7	0 58.8	10
9 0	0 48.9	0 49.8	0 51.1	0 51.8	0 52.5	0 53.3	0 54.2	0 55.3	0 56.4	15 0

TABLE IV.

AZIMUTH OF POLARIS AT ALL HOUR ANGLES, 1916.

[For hour angles 0h to 12h the star is west of north, and for hour angles 12h to 24h it is east of north.]

H. A. \ Lat.	10°	15°	20°	22°	24°	26°	28°	30°	32°	Lat. / H. A.
h m	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	h m
9 0	0 48.9	0 49.8	0 51.1	0 51.8	0 52.5	0 53.3	0 54.2	0 55.3	0 56.4	15 0
10	0 46.7	0 47.5	0 48.8	0 49.4	0 50.1	0 50.9	0 51.8	0 52.8	0 53.9	14 50
20	0 44.4	0 45.2	0 46.4	0 47.0	0 47.7	0 48.4	0 49.3	0 50.2	0 51.2	40
9 30	0 42.1	0 42.8	0 44.0	0 44.5	0 45.2	0 45.9	0 46.7	0 47.5	0 48.5	14 30
40	0 39.6	0 40.3	0 41.4	0 41.9	0 42.5	0 43.2	0 44.0	0 44.8	0 45.7	20
50	0 37.1	0 37.8	0 38.8	0 39.3	0 39.8	0 40.5	0 41.2	0 41.9	0 42.8	10
10 0	0 34.5	0 35.2	0 36.1	0 36.5	0 37.1	0 37.7	0 38.3	0 39.0	0 39.8	14 0
10	0 31.9	0 32.5	0 33.3	0 33.7	0 34.2	0 34.8	0 35.4	0 36.0	0 36.8	13 50
20	0 29.2	0 29.7	0 30.5	0 30.9	0 31.3	0 31.8	0 32.4	0 33.0	0 33.6	40
10 30	0 26.4	0 26.9	0 27.6	0 28.0	0 28.4	0 28.8	0 29.3	0 29.9	0 30.4	13 30
40	0 23.6	0 24.0	0 24.7	0 25.0	0 25.3	0 25.7	0 26.2	0 26.7	0 27.2	20
50	0 20.8	0 21.1	0 21.7	0 22.0	0 22.3	0 22.6	0 23.0	0 23.5	0 23.9	10
11 0	0 17.9	0 18.2	0 18.7	0 18.9	0 19.2	0 19.5	0 19.8	0 20.2	0 20.6	13 0
10	0 15.0	0 15.2	0 15.6	0 15.8	0 16.0	0 16.3	0 16.6	0 16.9	0 17.2	12 50
20	0 12.0	0 12.2	0 12.5	0 12.7	0 12.9	0 13.1	0 13.3	0 13.5	0 13.8	40
11 30	0 9.0	0 9.2	0 9.4	0 9.5	0 9.7	0 9.8	0 10.0	0 10.2	0 10.4	12 30
40	0 6.0	0 6.1	0 6.3	0 6.4	0 6.5	0 6.6	0 6.7	0 6.8	0 6.9	20
50	0 3.0	0 3.1	0 3.1	0 3.2	0 3.2	0 3.3	0 3.3	0 3.4	0 3.5	10
12 0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	12 0

H. A. \ Lat.	32°	34°	36°	38°	40°	42°	44°	46°	48°	Lat. / H. A.
h m	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	h m
0 0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	24 0
10	0 3.6	0 3.6	0 3.7	0 3.8	0 3.9	0 4.1	0 4.2	0 4.4	0 4.6	23 50
20	0 7.1	0 7.3	0 7.5	0 7.7	0 7.9	0 8.2	0 8.4	0 8.8	0 9.1	40
0 30	0 10.6	0 10.9	0 11.2	0 11.5	0 11.8	0 12.2	0 12.6	0 13.1	0 13.6	23 30
40	0 14.1	0 14.5	0 14.9	0 15.3	0 15.7	0 16.2	0 16.8	0 17.4	0 18.1	20
50	0 17.6	0 18.1	0 18.5	0 19.0	0 19.6	0 20.2	0 20.9	0 21.7	0 22.6	10
1 0	0 21.1	0 21.6	0 22.1	0 22.7	0 23.4	0 24.2	0 25.0	0 25.9	0 27.0	23 0
10	0 24.5	0 25.1	0 25.7	0 26.4	0 27.2	0 28.1	0 29.0	0 30.1	0 31.3	22 50
20	0 27.9	0 28.5	0 29.2	0 30.0	0 30.9	0 31.9	0 33.0	0 34.2	0 35.6	40
1 30	0 31.2	0 31.9	0 32.7	0 33.6	0 34.6	0 35.7	0 36.9	0 38.3	0 39.8	22 30
40	0 34.4	0 35.2	0 36.1	0 37.1	0 38.2	0 39.4	0 40.8	0 42.3	0 44.0	20
50	0 37.6	0 38.5	0 39.5	0 40.5	0 41.7	0 43.1	0 44.6	0 46.2	0 48.0	10
2 0	0 40.7	0 41.6	0 42.7	0 43.9	0 45.2	0 46.6	0 48.2	0 50.0	0 52.0	22 0
10	0 43.7	0 44.7	0 45.9	0 47.1	0 48.5	0 50.1	0 51.8	0 53.7	0 55.8	21 50
20	0 46.6	0 47.7	0 49.0	0 50.3	0 51.8	0 53.4	0 55.3	0 57.3	0 59.6	40
2 30	0 49.5	0 50.6	0 51.9	0 53.4	0 55.0	0 56.7	0 58.6	1 0.8	1 3.2	21 30
40	0 52.2	0 53.5	0 54.8	0 56.3	0 58.0	0 59.8	1 1.9	1 4.2	1 6.7	20
50	0 54.9	0 56.2	0 57.6	0 59.2	1 0.9	1 2.9	1 5.0	1 7.4	1 10.0	10
3 0	0 57.4	0 58.8	1 0.3	1 1.9	1 3.7	1 5.8	1 8.0	1 10.5	1 13.2	21 0
10	0 59.8	1 1.2	1 2.8	1 4.5	1 6.4	1 8.5	1 10.9	1 13.5	1 16.3	20 50
20	1 2.1	1 3.6	1 5.2	1 7.0	1 9.0	1 11.1	1 13.6	1 16.3	1 19.2	40
3 30	1 4.3	1 5.8	1 7.5	1 9.4	1 11.4	1 13.6	1 16.2	1 18.9	1 22.0	20 30
40	1 6.4	1 7.9	1 9.7	1 11.6	1 13.7	1 16.0	1 18.6	1 21.4	1 24.6	20
50	1 8.3	1 9.9	1 11.7	1 13.7	1 15.8	1 18.2	1 20.9	1 23.8	1 27.0	10
4 0	1 10.1	1 11.8	1 13.6	1 15.6	1 17.8	1 20.2	1 23.0	1 26.0	1 29.3	20 0
10	1 11.8	1 13.5	1 15.3	1 17.4	1 19.6	1 22.1	1 24.9	1 28.0	1 31.4	19 50
20	1 13.3	1 15.0	1 16.9	1 19.0	1 21.3	1 23.9	1 26.7	1 29.8	1 33.3	40
4 30	1 14.7	1 16.4	1 18.4	1 20.5	1 22.8	1 25.4	1 28.3	1 31.5	1 35.0	19 30
40	1 15.9	1 17.7	1 19.7	1 21.8	1 24.2	1 26.8	1 29.7	1 33.0	1 36.6	20
50	1 17.0	1 18.8	1 20.8	1 23.0	1 25.4	1 28.1	1 31.0	1 34.3	1 37.9	10
5 0	1 18.0	1 19.8	1 21.8	1 24.0	1 26.4	1 29.1	1 32.1	1 35.4	1 39.1	19 0

TABLE IV.

AZIMUTH OF POLARIS AT ALL HOUR ANGLES, 1916.

[For hour angles 0h to 12h the star is west of north, and for hour angles 12h to 24h it is east of north.]

Lat. H.A.	32°	34°	36°	38°	40°	42°	44°	46°	48°	Lat. H.A.
h m	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	h m
5 0	1 18.0	1 19.8	1 21.8	1 24.0	1 26.4	1 29.1	1 32.1	1 35.4	1 39.1	19 0
10	1 18.8	1 20.6	1 22.6	1 24.8	1 27.3	1 30.0	1 33.0	1 36.3	1 40.1	18 50
20	1 19.4	1 21.3	1 23.3	1 25.5	1 28.0	1 30.7	1 33.7	1 37.1	1 40.8	40
5 30	1 19.9	1 21.8	1 23.8	1 26.0	1 28.5	1 31.3	1 34.3	1 37.7	1 41.4	18 30
40	1 20.3	1 22.1	1 24.1	1 26.4	1 28.9	1 31.6	1 34.7	1 38.1	1 41.8	20
50	1 20.5	1 22.3	1 24.3	1 26.6	1 29.1	1 31.8	1 34.9	1 38.2	1 42.0	10
6 0	1 20.5	1 22.3	1 24.4	1 26.6	1 29.1	1 31.8	1 34.9	1 38.2	1 42.0	18 0
10	1 20.4	1 22.2	1 24.2	1 26.5	1 28.9	1 31.7	1 34.7	1 38.1	1 41.8	17 50
20	1 20.1	1 21.9	1 23.9	1 26.2	1 28.6	1 31.4	1 34.4	1 37.7	1 41.4	40
6 30	1 19.7	1 21.5	1 23.5	1 25.7	1 28.1	1 30.9	1 33.8	1 37.1	1 40.8	17 30
40	1 19.1	1 20.9	1 22.9	1 25.1	1 27.5	1 30.2	1 33.1	1 36.4	1 40.1	20
50	1 18.4	1 20.1	1 22.1	1 24.3	1 26.7	1 29.3	1 32.2	1 35.5	1 39.1	10
7 0	1 17.5	1 19.2	1 21.2	1 23.3	1 25.7	1 28.3	1 31.2	1 34.4	1 38.0	17 0
10	1 16.5	1 18.2	1 20.1	1 22.2	1 24.5	1 27.1	1 30.0	1 33.1	1 36.6	16 50
20	1 15.3	1 17.0	1 18.9	1 20.9	1 23.2	1 25.8	1 28.6	1 31.7	1 35.1	40
7 30	1 14.0	1 15.7	1 17.5	1 19.5	1 21.8	1 24.3	1 27.0	1 30.1	1 33.4	16 30
40	1 12.6	1 14.2	1 16.0	1 18.0	1 20.2	1 22.6	1 25.3	1 28.3	1 31.6	20
50	1 11.0	1 12.6	1 14.3	1 16.3	1 18.4	1 20.8	1 23.4	1 26.3	1 29.6	10
8 0	1 9.3	1 10.8	1 12.5	1 14.4	1 16.5	1 18.8	1 21.4	1 24.2	1 27.4	16 0
10	1 7.4	1 8.9	1 10.6	1 12.4	1 14.5	1 16.7	1 19.2	1 21.9	1 25.0	15 50
20	1 5.5	1 6.9	1 8.5	1 10.3	1 12.3	1 14.5	1 16.9	1 19.5	1 22.5	40
8 30	1 3.4	1 4.8	1 6.3	1 8.1	1 10.0	1 12.1	1 14.4	1 17.0	1 19.8	15 30
40	1 1.2	1 2.5	1 4.0	1 5.7	1 7.5	1 9.6	1 11.8	1 14.3	1 17.0	20
50	0 58.8	1 0.1	1 1.6	1 3.2	1 5.0	1 6.9	1 9.1	1 11.4	1 14.1	10
9 0	0 56.4	0 57.7	0 59.0	1 0.6	1 2.3	1 4.1	1 6.2	1 8.5	1 11.0	15 0
10	0 53.9	0 55.1	0 56.4	0 57.8	0 59.4	1 1.2	1 3.2	1 5.4	1 7.8	14 50
20	0 51.2	0 52.4	0 53.6	0 55.0	0 56.5	0 58.2	1 0.1	1 2.2	1 4.4	40
9 30	0 48.5	0 49.6	0 50.8	0 52.1	0 53.5	0 55.1	0 56.9	0 58.8	1 1.0	14 30
40	0 45.7	0 46.7	0 47.8	0 49.0	0 50.4	0 51.9	0 53.6	0 55.4	0 57.4	20
50	0 42.8	0 43.7	0 44.8	0 45.9	0 47.2	0 48.6	0 50.2	0 51.9	0 53.8	10
10 0	0 39.8	0 40.7	0 41.7	0 42.7	0 43.9	0 45.2	0 46.7	0 48.2	0 50.0	14 0
10	0 36.8	0 37.6	0 38.5	0 39.4	0 40.5	0 41.7	0 43.1	0 44.5	0 46.2	13 50
20	0 33.6	0 34.4	0 35.2	0 36.1	0 37.1	0 38.2	0 39.4	0 40.7	0 42.2	40
10 30	0 30.4	0 31.1	0 31.9	0 32.7	0 33.6	0 34.6	0 35.7	0 36.9	0 38.2	13 30
40	0 27.2	0 27.8	0 28.5	0 29.2	0 30.0	0 30.9	0 31.9	0 33.0	0 34.2	20
50	0 23.9	0 24.4	0 25.0	0 25.7	0 26.4	0 27.2	0 28.0	0 29.0	0 30.0	10
11 0	0 20.6	0 21.0	0 21.5	0 22.1	0 22.7	0 23.4	0 24.1	0 24.9	0 25.8	13 0
10	0 17.2	0 17.6	0 18.0	0 18.5	0 19.0	0 19.5	0 20.2	0 20.8	0 21.6	12 50
20	0 13.8	0 14.1	0 14.4	0 14.8	0 15.2	0 15.7	0 16.2	0 16.7	0 17.3	40
11 30	0 10.4	0 10.6	0 10.8	0 11.1	0 11.4	0 11.8	0 12.2	0 12.6	0 13.0	12 30
40	0 6.9	0 7.1	0 7.2	0 7.4	0 7.6	0 7.8	0 8.1	0 8.4	0 8.7	20
50	0 3.5	0 3.5	0 3.6	0 3.7	0 3.8	0 3.9	0 4.1	0 4.2	0 4.3	10
12 0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	12 0

Lat. H.A.	48°	50°	52°	54°	56°	58°	60°	61°	62°	Lat. H.A.
h m	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	h m
0 0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	24 0
10	0 4.6	0 4.7	0 5.0	0 5.2	0 5.5	0 5.8	0 6.2	0 6.4	0 6.6	23 50
20	0 9.1	0 9.5	0 9.9	0 10.4	0 10.9	0 11.6	0 12.3	0 12.7	0 13.2	40
0 30	0 13.6	0 14.2	0 14.8	0 15.6	0 16.4	0 17.3	0 18.4	0 19.1	0 19.7	23 30
40	0 18.1	0 18.9	0 19.7	0 20.7	0 21.8	0 23.0	0 24.5	0 25.3	0 26.2	20
50	0 22.6	0 23.5	0 24.6	0 25.8	0 27.2	0 28.7	0 30.5	0 31.6	0 32.7	10
1 0	0 27.0	0 28.1	0 29.4	0 30.8	0 32.5	0 34.4	0 36.5	0 37.7	0 39.0	23 0

TABLE IV.

AZIMUTH OF POLARIS AT ALL HOUR ANGLES, 1916.

or hour angles 0^{h} to 12^{h} the star is west of north, and for hour angles 12^{h} to 24^{h} it is east of north.]

Lat. . A.	48°	50°	52°	54°	56°	58°	60°	61°	62°	Lat. H. A.
h m	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	h m
1 0	0 27.0	0 28.1	0 29.4	0 30.8	0 32.5	0 34.4	0 36.5	0 37.7	0 39.0	23 0
10	0 31.3	0 32.6	0 34.1	0 35.8	0 37.7	0 39.9	0 42.4	0 43.8	0 45.3	22 50
20	0 35.6	0 37.1	0 38.8	0 40.7	0 42.9	0 45.4	0 48.2	0 49.8	0 51.5	40
1 30	0 39.8	0 41.5	0 43.4	0 45.6	0 48.0	0 50.7	0 53.9	0 55.7	0 57.6	22 30
40	0 44.0	0 45.8	0 47.9	0 50.3	0 53.0	0 56.0	0 59.5	1 1.5	1 3.6	20
50	0 48.0	0 50.1	0 52.3	0 54.9	0 57.8	1 1.2	1 5.0	1 7.1	1 9.4	10
2 0	0 52.0	0 54.2	0 56.6	0 59.4	1 2.6	1 6.2	1 10.3	1 12.6	1 15.1	22 0
10	0 55.8	0 58.2	1 0.8	1 3.8	1 7.2	1 11.1	1 15.5	1 18.0	1 20.6	21 50
20	0 59.6	1 2.1	1 4.9	1 8.1	1 11.7	1 15.8	1 20.5	1 23.2	1 26.0	40
2 30	1 3.2	1 5.9	1 8.8	1 12.2	1 16.0	1 20.4	1 25.4	1 28.2	1 31.2	21 30
40	1 6.7	1 9.5	1 12.6	1 16.2	1 20.2	1 24.8	1 30.1	1 33.0	1 36.2	20
50	1 10.0	1 13.0	1 16.3	1 20.0	1 24.2	1 29.0	1 34.6	1 37.7	1 41.0	10
3 0	1 13.2	1 16.3	1 19.8	1 23.7	1 28.1	1 33.1	1 38.9	1 42.1	1 45.6	21 0
10	1 16.3	1 19.5	1 23.1	1 27.2	1 31.8	1 37.0	1 43.0	1 46.3	1 50.0	20 50
20	1 19.2	1 22.6	1 26.3	1 30.5	1 35.3	1 40.7	1 46.9	1 50.3	1 54.1	40
3 30	1 22.0	1 25.5	1 29.3	1 33.6	1 38.6	1 44.2	1 50.6	1 54.1	1 58.0	20 30
40	1 24.6	1 28.2	1 32.1	1 36.6	1 41.7	1 47.4	1 54.0	1 57.7	2 1.7	20
50	1 27.0	1 30.7	1 34.8	1 39.4	1 44.6	1 50.5	1 57.3	2 1.0	2 5.1	10
4 0	1 29.3	1 33.0	1 37.2	1 41.9	1 47.3	1 53.3	2 0.2	2 4.1	2 8.3	20 0
10	1 31.4	1 35.2	1 39.5	1 44.3	1 49.7	1 55.9	2 3.0	2 6.9	2 11.2	19 50
20	1 33.3	1 37.2	1 41.6	1 46.5	1 52.0	1 58.3	2 5.5	2 9.5	2 13.8	40
4 30	1 35.0	1 39.0	1 43.4	1 48.4	1 54.0	2 0.4	2 7.8	2 11.8	2 16.2	19 30
40	1 36.6	1 40.6	1 45.1	1 50.1	1 55.8	2 2.3	2 9.8	2 13.9	2 18.3	20
50	1 37.9	1 42.0	1 46.5	1 51.6	1 57.4	2 4.0	2 11.5	2 15.7	2 20.2	10
5 0	1 39.1	1 43.2	1 47.8	1 52.9	1 58.8	2 5.4	2 13.0	2 17.2	2 21.7	19 0
10	1 40.1	1 44.2	1 48.8	1 54.0	1 59.9	2 6.6	2 14.2	2 18.5	2 23.0	18 50
20	1 40.8	1 45.0	1 49.6	1 54.9	2 0.8	2 7.5	2 15.2	2 19.5	2 24.0	40
5 30	1 41.4	1 45.6	1 50.3	1 55.5	2 1.5	2 8.2	2 15.9	2 20.2	2 24.8	18 30
40	1 41.8	1 46.0	1 50.7	1 55.9	2 1.9	2 8.6	2 16.4	2 20.6	2 25.2	20
50	1 42.0	1 46.2	1 50.9	1 56.1	2 2.1	2 8.8	2 16.6	2 20.8	2 25.4	10
6 0	1 42.0	1 46.2	1 50.9	1 56.1	2 2.1	2 8.8	2 16.5	2 20.7	2 25.3	18 0
10	1 41.8	1 46.0	1 50.6	1 55.9	2 1.8	2 8.5	2 16.1	2 20.4	2 24.9	17 50
20	1 41.4	1 45.6	1 50.2	1 55.4	2 1.3	2 8.0	2 15.5	2 19.8	2 24.3	40
6 30	1 40.8	1 44.9	1 49.6	1 54.7	2 0.6	2 7.2	2 14.7	2 18.9	2 23.4	17 30
40	1 40.1	1 44.1	1 48.7	1 53.8	1 59.6	2 6.2	2 13.6	2 17.7	2 22.2	20
50	1 39.1	1 43.1	1 47.6	1 52.7	1 58.4	2 4.9	2 12.3	2 16.3	2 20.7	10
7 0	1 38.0	1 41.9	1 46.4	1 51.4	1 57.0	2 3.4	2 10.7	2 14.7	2 19.0	17 0
10	1 36.6	1 40.5	1 44.9	1 49.8	1 55.4	2 1.6	2 8.8	2 12.8	2 17.0	16 50
20	1 35.1	1 39.0	1 43.3	1 48.1	1 53.5	1 59.7	2 6.7	2 10.7	2 14.8	40
7 30	1 33.4	1 37.2	1 41.4	1 46.2	1 51.5	1 57.5	2 4.4	2 8.3	2 12.4	16 30
40	1 31.6	1 35.3	1 39.4	1 44.0	1 49.2	1 55.2	2 1.9	2 5.6	2 9.7	20
50	1 29.6	1 33.2	1 37.2	1 41.7	1 46.8	1 52.6	1 59.2	2 2.8	2 6.7	10
8 0	1 27.4	1 30.9	1 34.8	1 39.2	1 44.1	1 49.8	1 56.2	1 59.7	2 3.5	16 0
10	1 25.0	1 28.4	1 32.2	1 36.5	1 41.3	1 46.8	1 53.0	1 56.5	2 0.1	15 50
20	1 22.5	1 25.8	1 29.5	1 33.6	1 38.3	1 43.6	1 49.6	1 53.0	1 56.5	40
8 30	1 19.8	1 23.0	1 26.6	1 30.6	1 35.1	1 40.2	1 46.0	1 49.3	1 52.7	15 30
40	1 17.0	1 20.1	1 23.5	1 27.4	1 31.7	1 36.6	1 42.3	1 45.4	1 48.7	20
50	1 14.1	1 17.0	1 20.3	1 24.0	1 28.2	1 32.9	1 38.3	1 41.3	1 44.5	10
9 0	1 11.0	1 13.8	1 17.0	1 20.5	1 24.5	1 29.0	1 34.2	1 37.1	1 40.1	15 0
10	1 7.8	1 10.5	1 13.5	1 16.9	1 20.7	1 25.0	1 29.9	1 32.7	1 35.6	14 50
20	1 4.4	1 7.0	1 9.9	1 13.1	1 16.7	1 20.8	1 25.5	1 28.1	1 30.8	40
9 30	1 1.0	1 3.4	1 6.1	1 9.2	1 12.6	1 16.4	1 20.9	1 23.3	1 25.9	14 30
40	0 57.4	0 59.7	1 2.3	1 5.1	1 8.3	1 11.9	1 16.1	1 18.4	1 20.9	20
50	0 53.8	0 55.9	0 58.3	1 1.0	1 3.9	1 7.3	1 11.2	1 13.4	1 15.7	10
10 0	0 50.0	0 52.0	0 54.2	0 56.7	0 59.5	1 2.6	1 6.2	1 8.3	1 10.4	14 0

AZIMUTH OF POLARIS AT ALL HOUR ANGLES, 1916.

[For hour angles 0^h to 12^h the star is west of north, and for hour angles 12^h to 24^h it is east of north.]

H. A. / Lat.	48°	50°	52°	54°	56°	58°	60°	61°	62°	Lat. / H. A.
h m	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	h m
10 0	0 50.0	0 52.0	0 54.2	0 56.7	0 59.5	1 2.6	1 6.2	1 8.3	1 10.4	14 0
10	0 46.2	0 48.0	0 50.0	0 52.3	0 54.9	0 57.8	1 1.1	1 3.0	1 5.0	13 50
20	0 42.2	0 43.9	0 45.8	0 47.8	0 50.2	0 52.9	0 55.9	0 57.6	0 59.4	40
10 30	0 38.2	0 39.7	0 41.4	0 43.3	0 45.4	0 47.8	0 50.6	0 52.2	0 53.8	13 30
40	0 34.2	0 35.5	0 37.0	0 38.7	0 40.6	0 42.7	0 45.2	0 46.6	0 48.0	20
50	0 30.0	0 31.2	0 32.5	0 34.0	0 35.7	0 37.5	0 39.7	0 40.9	0 42.2	10
11 0	0 25.8	0 26.8	0 28.0	0 29.3	0 30.7	0 32.3	0 34.2	0 35.2	0 36.3	13 0
10	0 21.6	0 22.4	0 23.4	0 24.5	0 25.7	0 27.0	0 28.6	0 29.4	0 30.4	12 50
20	0 17.3	0 18.0	0 18.8	0 19.6	0 20.6	0 21.7	0 22.9	0 23.6	0 24.4	40
11 30	0 13.0	0 13.5	0 14.1	0 14.7	0 15.5	0 16.3	0 17.2	0 17.8	0 18.3	12 30
40	0 8.7	0 9.0	0 9.4	0 9.8	0 10.3	0 10.9	0 11.5	0 11.9	0 12.2	20
50	0 4.3	0 4.5	0 4.7	0 4.9	0 5.2	0 5.4	0 5.8	0 6.0	0 6.1	10
12 0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	12 0

H. A. / Lat.	62°	63°	64°	65°	66°	67°	68°	69°	70°	Lat. / H. A.
h m	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	h m
0 0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	24 0
10	0 6.6	0 6.8	0 7.1	0 7.4	0 7.7	0 8.0	0 8.4	0 8.8	0 9.2	23 50
20	0 13.2	0 13.6	0 14.2	0 14.7	0 15.3	0 16.0	0 16.7	0 17.5	0 18.4	40
0 30	0 19.7	0 20.4	0 21.2	0 22.0	0 22.9	0 23.9	0 25.0	0 26.2	0 27.5	23 30
40	0 26.2	0 27.1	0 28.2	0 29.3	0 30.5	0 31.8	0 33.2	0 34.8	0 36.6	20
50	0 32.7	0 33.8	0 35.1	0 36.5	0 38.0	0 39.6	0 41.4	0 43.4	0 45.6	10
1 0	0 39.0	0 40.4	0 41.9	0 43.6	0 45.4	0 47.3	0 49.5	0 51.9	0 54.5	23 0
10	0 45.3	0 47.0	0 48.7	0 50.6	0 52.7	0 55.0	0 57.5	1 0.3	1 3.3	22 50
20	0 51.5	0 53.4	0 55.4	0 57.5	0 59.9	1 2.5	1 5.3	1 8.5	1 11.9	40
1 30	0 57.6	0 59.7	1 1.9	1 4.3	1 7.0	1 9.9	1 13.0	1 16.5	1 20.4	22 30
40	1 3.6	1 5.9	1 8.3	1 11.0	1 13.9	1 17.1	1 20.6	1 24.4	1 28.7	20
50	1 9.4	1 11.9	1 14.6	1 17.5	1 20.7	1 24.1	1 28.0	1 32.1	1 36.8	10
2 0	1 15.1	1 17.8	1 20.7	1 23.8	1 27.3	1 31.0	1 35.1	1 39.7	1 44.7	22 0
10	1 20.6	1 23.5	1 26.6	1 30.0	1 33.7	1 37.7	1 42.1	1 47.0	1 52.4	21 50
20	1 26.0	1 29.1	1 32.4	1 36.0	1 39.9	1 44.2	1 48.9	1 54.1	1 59.8	40
2 30	1 31.2	1 34.4	1 37.9	1 41.7	1 45.9	1 50.4	1 55.4	2 0.9	2 6.9	21 30
40	1 36.2	1 39.6	1 43.3	1 47.3	1 51.7	1 56.4	2 1.7	2 7.4	2 13.8	20
50	1 41.0	1 44.6	1 48.4	1 52.6	1 57.2	2 2.2	2 7.7	2 13.7	2 20.4	10
3 0	1 45.6	1 49.3	1 53.3	1 57.7	2 2.5	2 7.7	2 13.4	2 19.7	2 26.7	21 0
10	1 50.0	1 53.8	1 58.0	2 2.6	2 7.5	2 12.9	2 18.9	2 25.4	2 32.7	20 50
20	1 54.1	1 58.1	2 2.4	2 7.2	2 12.3	2 17.9	2 24.1	2 30.8	2 38.3	40
3 30	1 58.0	2 2.1	2 6.6	2 11.5	2 16.8	2 22.6	2 28.9	2 35.9	2 43.6	20 30
40	2 1.7	2 5.9	2 10.5	2 15.6	2 21.0	2 27.0	2 33.5	2 40.7	2 48.6	20
50	2 5.1	2 9.5	2 14.2	2 19.3	2 24.9	2 31.0	2 37.7	2 45.1	2 53.3	10
4 0	2 8.3	2 12.7	2 17.6	2 22.8	2 28.6	2 34.8	2 41.7	2 49.2	2 57.5	20 0
10	2 11.2	2 15.7	2 20.7	2 26.1	2 31.9	2 38.3	2 45.3	2 52.9	3 1.4	19 50
20	2 13.8	2 18.5	2 23.5	2 29.0	2 34.9	2 41.4	2 48.5	2 56.3	3 5.0	40
4 30	2 16.2	2 20.9	2 26.0	2 31.6	2 37.6	2 44.2	2 51.4	2 59.4	3 8.1	19 30
40	2 18.3	2 23.1	2 28.3	2 33.9	2 40.0	2 46.7	2 54.0	3 2.1	3 10.9	20
50	2 20.2	2 25.0	2 30.2	2 35.9	2 42.1	2 48.9	2 56.2	3 4.4	3 13.3	10
5 0	2 21.7	2 26.6	2 31.9	2 37.6	2 43.9	2 50.7	2 58.1	3 6.3	3 15.3	19 0
10	2 23.0	2 28.0	2 33.3	2 39.0	2 45.3	2 52.2	2 59.6	3 7.9	3 17.0	18 50
20	2 24.0	2 29.0	2 34.3	2 40.1	2 46.4	2 53.3	3 0.8	3 9.1	3 18.2	40
5 30	2 24.8	2 29.7	2 35.1	2 40.9	2 47.2	2 54.1	3 1.6	3 9.9	3 19.1	18 30
40	2 25.2	2 30.2	2 35.6	2 41.4	2 47.7	2 54.6	3 2.1	3 10.4	3 19.5	20
50	2 25.4	2 30.4	2 35.7	2 41.6	2 47.9	2 54.7	3 2.2	3 10.5	3 19.6	10
6 0	2 25.3	2 30.3	2 35.6	2 41.4	2 47.7	2 54.5	3 2.0	3 10.3	3 19.4	18 0

AZIMUTH OF POLARIS AT ALL HOUR ANGLES, 1916.

[For hour angles 0^h to 12^h the star is west of north, and for hour angles 12^h to 24^h it is east of north.]

H. A. \ Lat.	62°	63°	64°	65°	66°	67°	68°	69°	70°	Lat. / H. A.
h m	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	h m
6 0	2 25.3	2 30.3	2 35.6	2 41.4	2 47.7	2 54.5	3 2.0	3 10.3	3 19.4	18 0
10	2 24.9	2 29.9	2 35.2	2 41.0	2 47.2	2 54.0	3 1.5	3 9.7	3 18.7	17 50
20	2 24.3	2 29.2	2 34.5	2 40.2	2 46.4	2 53.2	3 0.6	3 8.7	3 17.7	40
6 30	2 23.4	2 28.2	2 33.5	2 39.1	2 45.3	2 52.0	2 59.4	3 7.4	3 16.3	17 30
40	2 22.2	2 27.0	2 32.2	2 37.8	2 43.9	2 50.5	2 57.8	3 5.7	3 14.5	20
50	2 20.7	2 25.5	2 30.6	2 36.1	2 42.2	2 48.7	2 55.9	3 3.7	3 12.4	10
7 0	2 19.0	2 23.7	2 28.7	2 34.2	2 40.1	2 46.6	2 53.6	3 1.4	3 9.9	17 0
10	2 17.0	2 21.7	2 26.6	2 32.0	2 37.8	2 44.2	2 51.1	2 58.7	3 7.1	16 50
20	2 14.8	2 19.4	2 24.2	2 29.5	2 35.2	2 41.4	2 48.3	2 55.7	3 3.9	40
7 30	2 12.4	2 16.8	2 21.6	2 26.7	2 32.3	2 38.4	2 45.1	2 52.4	3 0.4	16 30
40	2 9.7	2 14.0	2 18.7	2 23.7	2 29.2	2 35.1	2 41.6	2 48.8	2 56.6	20
50	2 6.7	2 11.0	2 15.5	2 20.4	2 25.8	2 31.6	2 37.9	2 44.9	2 52.5	10
8 0	2 3.5	2 7.7	2 12.1	2 16.9	2 22.1	2 27.7	2 33.9	2 40.7	2 48.1	16 0
10	2 0.1	2 4.2	2 8.5	2 13.1	2 18.2	2 23.6	2 29.6	2 36.2	2 43.4	15 50
20	1 56.5	2 0.4	2 4.6	2 9.1	2 14.0	2 19.3	2 25.1	2 31.4	2 38.4	40
8 30	1 52.7	1 56.5	2 0.5	2 4.9	2 9.6	2 14.7	2 20.3	2 26.4	2 33.1	15 30
40	1 48.7	1 52.3	1 56.2	2 0.4	2 4.9	2 9.9	2 15.2	2 21.1	2 27.6	20
50	1 44.5	1 48.0	1 51.7	1 55.7	2 0.1	2 4.8	2 10.0	2 15.6	2 21.8	10
9 0	1 40.1	1 43.4	1 47.0	1 50.8	1 55.0	1 59.5	2 4.5	2 9.9	2 15.8	15 0
10	1 35.6	1 38.7	1 42.1	1 45.8	1 49.7	1 54.0	1 58.7	2 3.9	2 9.6	14 50
20	1 30.8	1 33.8	1 37.0	1 40.5	1 44.3	1 48.4	1 52.8	1 57.7	2 3.1	40
9 30	1 25.9	1 28.8	1 31.8	1 35.1	1 38.7	1 42.5	1 46.7	1 51.3	1 56.4	14 30
40	1 20.9	1 23.6	1 26.4	1 29.5	1 32.9	1 36.5	1 40.4	1 44.8	1 49.5	20
50	1 15.7	1 18.2	1 20.9	1 23.8	1 26.9	1 30.3	1 34.0	1 38.0	1 42.5	10
10 0	1 10.4	1 12.7	1 15.2	1 17.9	1 20.8	1 23.9	1 27.4	1 31.1	1 35.3	14 0
10	1 5.0	1 7.1	1 9.4	1 11.9	1 14.5	1 17.4	1 20.6	1 24.1	1 27.9	13 50
20	0 59.4	1 1.4	1 3.5	1 5.7	1 8.2	1 10.8	1 13.7	1 16.9	1 20.4	40
10 30	0 53.8	0 55.5	0 57.4	0 59.5	1 1.7	1 4.1	1 6.7	1 9.6	1 12.7	13 30
40	0 48.0	0 49.6	0 51.3	0 53.1	0 55.1	0 57.2	0 59.6	1 2.1	1 4.9	20
50	0 42.2	0 43.6	0 45.1	0 46.7	0 48.4	0 50.3	0 52.3	0 54.6	0 57.1	10
11 0	0 36.3	0 37.5	0 38.8	0 40.2	0 41.6	0 43.3	0 45.0	0 47.0	0 49.1	13 0
10	0 30.4	0 31.3	0 32.4	0 33.6	0 34.8	0 36.2	0 37.6	0 39.2	0 41.0	12 50
20	0 24.4	0 25.1	0 26.0	0 26.9	0 27.9	0 29.0	0 30.2	0 31.5	0 32.9	40
11 30	0 18.3	0 18.9	0 19.5	0 20.2	0 21.0	0 21.8	0 22.7	0 23.7	0 24.7	12 30
40	0 12.2	0 12.6	0 13.0	0 13.5	0 14.0	0 14.5	0 15.2	0 15.8	0 16.5	20
50	0 6.1	0 6.3	0 6.5	0 6.8	0 7.0	0 7.3	0 7.6	0 7.9	0 8.3	10
12 0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	12 0

TABLE IVa.

Table IV has been computed for a declination of 88° 51′ 45″. For other declinations of Polaris the correction given below should be applied to the Azimuth taken from Table IV.

Decl. \ Azimuth.	0′	20′	40′	60′	80′	100′	120′	140′	160′	180′	200′	Azimuth. / Decl.
° ′ ″	′	′	′	′	′	′	′	′	′	′	′	° ′ ″
88 51 20	0.0	+0.1	+0.2	+0.4	+0.5	+0.6	+0.7	+0.8	+1.0	+1.1	+1.2	88 51 20
88 51 25	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	88 51 25
88 51 30	0.0	+0.1	0.1	0.2	0.3	0.4	0.4	0.5	0.6	0.7	0.7	88 51 30
88 51 35	0.0	0.0	+0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.5	88 51 35
88 51 40	0.0	0.0	0.0	+0.1	+0.1	+0.1	+0.1	+0.2	+0.2	+0.2	+0.2	88 51 40
88 51 45	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	88 51 45
88 51 50	0.0	0.0	0.0	−0.1	−0.1	−0.1	−0.1	−0.2	−0.2	−0.2	−0.2	88 51 50
88 51 55	0.0	0.0	−0.1	−0.1	−0.2	−0.2	−0.3	−0.3	−0.4	−0.4	−0.5	88 51 55
88 52 0	0.0	−0.1	0.1	0.2	0.3	0.4	0.4	0.5	0.6	0.7	0.7	88 52 0
88 52 5	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	88 52 5
88 52 10	0.0	−0.1	−0.2	−0.4	−0.5	−0.6	−0.7	−0.8	−1.0	−1.1	−1.2	88 52 10

TABLE V.

AZIMUTH OF POLARIS AT ELONGATION, 1916.

Lat. \ Decl.	88° 51′ 20″	88° 51′ 30″	88° 51′ 40″	88° 51′ 50″	88° 52′ 0″	88° 52′ 10″	Variation for— 1′ of Lat.	Variation for— 1″ of δ.
° ′	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	″	″
10 0	1 9 43.6	1 9 33.4	1 9 23.3	1 9 13.1	1 9 2.9	1 8 52.8	+0.21	−1.02
10 20	1 9 47.9	1 9 37.8	1 9 27.6	1 9 17.4	1 9 7.3	1 8 57.1	0.22	1.02
10 40	1 9 52.4	1 9 42.3	1 9 32.1	1 9 21.9	1 9 11.8	1 9 1.6	0.23	1.02
11 0	1 9 57.1	1 9 46.9	1 9 36.8	1 9 26.6	1 9 16.4	1 9 6.2	0.24	1.02
11 20	1 10 1.9	1 9 51.7	1 9 41.6	1 9 31.4	1 9 21.2	1 9 11.0	0.24	1.02
11 40	1 10 6.9	1 9 56.7	1 9 46.5	1 9 36.3	1 9 26.1	1 9 15.9	+0.25	−1.02
12 0	1 10 12.1	1 10 1.8	1 9 51.6	1 9 41.4	1 9 31.2	1 9 20.9	0.26	1.02
12 20	1 10 17.3	1 10 7.1	1 9 56.9	1 9 46.6	1 9 36.4	1 9 26.2	0.27	1.03
12 40	1 10 22.8	1 10 12.5	1 10 2.3	1 9 52.0	1 9 41.8	1 9 31.5	0.28	1.03
13 0	1 10 28.4	1 10 18.1	1 10 7.9	1 9 57.6	1 9 47.3	1 9 37.1	0.28	1.03
13 20	1 10 34.2	1 10 23.9	1 10 13.6	1 10 3.3	1 9 53.0	1 9 42.8	+0.29	−1.03
13 40	1 10 40.1	1 10 29.8	1 10 19.5	1 10 9.2	1 9 58.9	1 9 48.6	0.30	1.03
14 0	1 10 46.2	1 10 35.8	1 10 25.5	1 10 15.2	1 10 4.9	1 9 54.6	0.30	1.03
14 20	1 10 52.4	1 10 42.1	1 10 31.7	1 10 21.4	1 10 11.1	1 10 0.8	0.31	1.03
14 40	1 10 58.8	1 10 48.4	1 10 38.1	1 10 27.8	1 10 17.4	1 10 7.1	0.32	1.03
15 0	1 11 5.4	1 10 55.0	1 10 44.6	1 10 34.3	1 10 23.9	1 10 13.6	+0.33	−1.04
15 20	1 11 12.1	1 11 1.7	1 10 51.4	1 10 41.0	1 10 30.6	1 10 20.2	0.34	1.04
15 40	1 11 19.0	1 11 8.6	1 10 58.2	1 10 47.8	1 10 37.4	1 10 27.1	0.34	1.04
16 0	1 11 26.1	1 11 15.7	1 11 5.2	1 10 54.8	1 10 44.4	1 10 34.0	0.35	1.04
16 20	1 11 33.3	1 11 22.9	1 11 12.4	1 11 2.0	1 10 51.6	1 10 41.2	0.36	1.04
16 40	1 11 40.7	1 11 30.3	1 11 19.8	1 11 9.4	1 10 58.9	1 10 48.5	+0.37	−1.04
17 0	1 11 48.3	1 11 37.8	1 11 27.4	1 11 16.9	1 11 6.4	1 10 56.0	0.38	1.05
17 20	1 11 56.0	1 11 45.5	1 11 35.1	1 11 24.6	1 11 14.1	1 11 3.6	0.39	1.05
17 40	1 12 4.0	1 11 53.5	1 11 43.0	1 11 32.5	1 11 22.0	1 11 11.5	0.40	1.05
18 0	1 12 12.1	1 12 1.5	1 11 51.0	1 11 40.5	1 11 30.0	1 11 19.5	0.41	1.05
18 20	1 12 20.3	1 12 9.8	1 11 59.3	1 11 48.7	1 11 38.2	1 11 27.7	+0.42	−1.05
18 40	1 12 28.8	1 12 18.2	1 12 7.7	1 11 57.1	1 11 46.6	1 11 36.0	0.42	1.06
19 0	1 12 37.4	1 12 26.9	1 12 16.3	1 12 5.7	1 11 55.1	1 11 44.5	0.43	1.06
19 20	1 12 46.2	1 12 35.6	1 12 25.1	1 12 14.5	1 12 3.9	1 11 53.3	0.44	1.06
19 40	1 12 55.3	1 12 44.6	1 12 34.0	1 12 23.4	1 12 12.8	1 12 2.2	0.45	1.06
20 0	1 13 4.4	1 12 53.8	1 12 43.2	1 12 32.5	1 12 21.9	1 12 11.2	+0.46	−1.06
20 20	1 13 13.8	1 13 3.2	1 12 52.5	1 12 41.8	1 12 31.2	1 12 20.5	0.47	1.07
20 40	1 13 23.4	1 13 12.7	1 13 2.0	1 12 51.3	1 12 40.7	1 12 30.0	0.48	1.07
21 0	1 13 33.2	1 13 22.5	1 13 11.7	1 13 1.0	1 12 50.3	1 12 39.6	0.49	1.07
21 20	1 13 43.1	1 13 32.4	1 13 21.6	1 13 10.9	1 13 0.2	1 12 49.4	0.50	1.07
21 40	1 13 53.3	1 13 42.5	1 13 31.7	1 13 21.0	1 13 10.2	1 12 59.5	+0.51	−1.08
22 0	1 14 3.6	1 13 52.8	1 13 42.0	1 13 31.2	1 13 20.5	1 13 9.7	0.52	1.08
22 20	1 14 14.2	1 14 3.4	1 13 52.5	1 13 41.7	1 13 30.9	1 13 20.1	0.53	1.08
22 40	1 14 24.9	1 14 14.1	1 14 3.2	1 13 52.4	1 13 41.6	1 13 30.7	0.54	1.08
23 0	1 14 35.9	1 14 25.0	1 14 14.1	1 14 3.3	1 13 52.4	1 13 41.5	0.55	1.09
23 20	1 14 47.0	1 14 36.1	1 14 25.2	1 14 14.3	1 14 3.4	1 13 52.6	+0.56	−1.09
23 40	1 14 58.4	1 14 47.5	1 14 36.5	1 14 25.6	1 14 14.7	1 14 3.8	0.57	1.09
24 0	1 15 10.0	1 14 59.0	1 14 48.1	1 14 37.1	1 14 26.2	1 14 15.2	0.58	1.10
24 20	1 15 21.8	1 15 10.8	1 14 59.8	1 14 48.8	1 14 37.9	1 14 26.9	0.59	1.10
24 40	1 15 33.8	1 15 22.8	1 15 11.8	1 15 0.8	1 14 49.7	1 14 38.7	0.60	1.10
25 0	1 15 46.0	1 15 34.9	1 15 23.9	1 15 12.9	1 15 1.8	1 14 50.8	+0.61	−1.10
25 20	1 15 58.4	1 15 47.4	1 15 36.3	1 15 25.2	1 15 14.2	1 15 3.1	0.62	1.11
25 40	1 16 11.1	1 16 0.0	1 15 48.9	1 15 37.8	1 15 26.7	1 15 15.6	0.64	1.11
26 0	1 16 24.0	1 16 12.9	1 16 1.7	1 15 50.6	1 15 39.5	1 15 28.4	0.65	1.11
26 20	1 16 37.1	1 16 26.0	1 16 14.8	1 16 3.6	1 15 52.5	1 15 41.3	0.66	1.12
26 40	1 16 50.5	1 16 39.3	1 16 28.1	1 16 16.9	1 16 5.7	1 15 54.5	+0.67	−1.12
27 0	1 17 4.1	1 16 52.8	1 16 41.6	1 16 30.4	1 16 19.2	1 16 7.9	0.68	1.12
27 20	1 17 17.9	1 17 6.6	1 16 55.4	1 16 44.1	1 16 32.9	1 16 21.6	0.69	1.13
27 40	1 17 32.0	1 17 20.7	1 17 9.4	1 16 58.1	1 16 46.8	1 16 35.5	0.70	1.13
28 0	1 17 46.3	1 17 34.9	1 17 23.6	1 17 12.3	1 17 1.0	1 16 49.6	0.72	1.13
28 20	1 18 0.8	1 17 49.5	1 17 38.1	1 17 26.8	1 17 15.4	1 17 4.0	+0.73	−1.14
28 40	1 18 15.6	1 18 4.3	1 17 52.8	1 17 41.5	1 17 30.1	1 17 18.7	0.74	1.14
29 0	1 18 30.7	1 18 19.3	1 18 7.8	1 17 56.4	1 17 45.0	1 17 33.5	0.76	1.14
29 20	1 18 46.0	1 18 34.6	1 18 23.1	1 18 11.6	1 18 0.2	1 17 48.7	0.77	1.15
29 40	1 19 1.6	1 18 50.1	1 18 38.6	1 18 27.1	1 18 15.6	1 18 4.1	0.78	1.15
30 0	1 19 17.5	1 19 5.9	1 18 54.4	1 18 42.8	1 18 31.3	1 18 19.7	+0.79	−1.16

AZIMUTH OF POLARIS AT ELONGATION, 1916.

Decl. / Lat.	88° 51′ 20″	88° 51′ 30″	88° 51′ 40″	88° 51′ 50″	88° 52′ 0″	88° 52′ 10″	Variation for— 1′ of Lat.	Variation for— 1″ of δ.
° ′	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	″	″
30 0	1 19 17.5	1 19 5.9	1 18 54.4	1 18 42.8	1 18 31.3	1 18 19.7	+0.79	−1.16
30 10	1 19 25.5	1 19 13.9	1 19 2.4	1 18 50.8	1 18 39.2	1 18 27.7	0.80	1.16
30 20	1 19 33.6	1 19 22.0	1 19 10.4	1 18 58.8	1 18 47.2	1 18 35.7	0.81	1.16
30 30	1 19 41.8	1 19 30.1	1 19 18.5	1 19 6.9	1 18 55.3	1 18 43.7	0.82	1.16
30 40	1 19 50.0	1 19 38.4	1 19 26.7	1 19 15.1	1 19 3.5	1 18 51.8	0.82	1.16
30 50	1 19 58.3	1 19 46.6	1 19 35.0	1 19 23.3	1 19 11.7	1 19 0.0	+0.83	−1.17
31 0	1 20 6.6	1 19 55.0	1 19 43.3	1 19 31.6	1 19 20.0	1 19 8.3	0.84	1.17
31 10	1 20 15.1	1 20 3.4	1 19 51.7	1 19 40.0	1 19 28.3	1 19 16.6	0.84	1.17
31 20	1 20 23.6	1 20 11.9	1 20 0.2	1 19 48.5	1 19 36.8	1 19 25.0	0.85	1.17
31 30	1 20 32.2	1 20 20.4	1 20 8.7	1 19 57.0	1 19 45.3	1 19 33.5	0.86	1.17
31 40	1 20 40.8	1 20 29.1	1 20 17.3	1 20 5.6	1 19 53.8	1 19 42.1	+0.86	−1.17
31 50	1 20 49.5	1 20 37.8	1 20 26.0	1 20 14.2	1 20 2.5	1 19 50.7	0.87	1.18
32 0	1 20 58.3	1 20 46.5	1 20 34.8	1 20 23.0	1 20 11.2	1 19 59.4	0.88	1.18
32 10	1 21 7.2	1 20 55.4	1 20 43.6	1 20 31.8	1 20 19.9	1 20 8.1	0.88	1.18
32 20	1 21 16.2	1 21 4.3	1 20 52.5	1 20 40.6	1 20 28.8	1 20 17.0	0.89	1.18
32 30	1 21 25.2	1 21 13.3	1 21 1.5	1 20 49.6	1 20 37.7	1 20 25.9	+0.90	−1.19
32 40	1 21 34.3	1 21 22.4	1 21 10.5	1 20 58.6	1 20 46.7	1 20 34.9	0.91	1.19
32 50	1 21 43.4	1 21 31.5	1 21 19.6	1 21 7.7	1 20 55.8	1 20 43.9	0.92	1.19
33 0	1 21 52.7	1 21 40.7	1 21 28.8	1 21 16.9	1 21 5.0	1 20 53.1	0.92	1.19
33 10	1 22 2.0	1 21 50.0	1 21 38.1	1 21 26.2	1 21 14.2	1 21 2.3	0.93	1.19
33 20	1 22 11.4	1 21 59.4	1 21 47.4	1 21 35.5	1 21 23.5	1 21 11.5	+0.94	−1.20
33 30	1 22 20.9	1 22 8.9	1 21 56.9	1 21 44.9	1 21 32.9	1 21 20.9	0.95	1.20
33 40	1 22 30.4	1 22 18.4	1 22 6.4	1 21 54.4	1 21 42.4	1 21 30.3	0.95	1.20
33 50	1 22 40.1	1 22 28.0	1 22 16.0	1 22 3.9	1 21 51.9	1 21 39.9	0.96	1.20
34 0	1 22 49.8	1 22 37.7	1 22 25.6	1 22 13.6	1 22 1.5	1 21 49.5	0.97	1.21
34 10	1 22 59.6	1 22 47.5	1 22 35.4	1 22 23.3	1 22 11.2	1 21 59.1	+0.98	−1.21
34 20	1 23 9.4	1 22 57.3	1 22 45.2	1 22 33.1	1 22 21.0	1 22 8.9	0.98	1.21
34 30	1 23 19.4	1 23 7.3	1 22 55.1	1 22 43.0	1 22 30.9	1 22 18.7	0.99	1.21
34 40	1 23 29.4	1 23 17.3	1 23 5.1	1 22 53.0	1 22 40.8	1 22 28.6	1.00	1.22
34 50	1 23 39.6	1 23 27.4	1 23 15.2	1 23 3.0	1 22 50.8	1 22 38.6	1.01	1.22
35 0	1 23 49.8	1 23 37.5	1 23 25.3	1 23 13.1	1 23 0.9	1 22 48.7	+1.02	−1.22
35 10	1 24 0.0	1 23 47.8	1 23 35.6	1 23 23.4	1 23 11.1	1 22 58.9	1.03	1.22
35 20	1 24 10.4	1 23 58.2	1 23 45.9	1 23 33.6	1 23 21.4	1 23 9.1	1.03	1.23
35 30	1 24 20.9	1 24 8.6	1 23 56.3	1 23 44.0	1 23 31.7	1 23 19.5	1.04	1.23
35 40	1 24 31.4	1 24 19.1	1 24 6.8	1 23 54.5	1 23 42.2	1 23 29.9	1.05	1.23
35 50	1 24 42.1	1 24 29.7	1 24 17.4	1 24 5.0	1 23 52.7	1 23 40.4	+1.06	−1.23
36 0	1 24 52.8	1 24 40.4	1 24 28.0	1 24 15.7	1 24 3.3	1 23 51.0	1.07	1.24
36 10	1 25 3.6	1 24 51.2	1 24 38.8	1 24 26.4	1 24 14.0	1 24 1.6	1.08	1.24
36 20	1 25 14.5	1 25 2.1	1 24 49.6	1 24 37.2	1 24 24.8	1 24 12.4	1.09	1.24
36 30	1 25 25.5	1 25 13.0	1 25 0.6	1 24 48.2	1 24 35.7	1 24 23.3	1.10	1.24
36 40	1 25 36.6	1 25 24.1	1 25 11.6	1 24 59.2	1 24 46.7	1 24 34.2	+1.10	−1.25
36 50	1 25 47.7	1 25 35.2	1 25 22.7	1 25 10.2	1 24 57.7	1 24 45.2	1.11	1.25
37 0	1 25 59.0	1 25 46.5	1 25 34.0	1 25 21.4	1 25 8.9	1 24 56.4	1.12	1.25
37 10	1 26 10.3	1 25 57.8	1 25 45.2	1 25 32.7	1 25 20.1	1 25 7.6	1.13	1.25
37 20	1 26 21.8	1 26 9.2	1 25 56.6	1 25 44.1	1 25 31.5	1 25 18.9	1.14	1.26
37 30	1 26 33.3	1 26 20.7	1 26 8.1	1 25 55.5	1 25 42.9	1 25 30.3	+1.15	−1.26
37 40	1 26 45.0	1 26 32.4	1 26 19.7	1 26 7.1	1 25 54.5	1 25 41.8	1.16	1.26
37 50	1 26 56.7	1 26 44.1	1 26 31.4	1 26 18.7	1 26 6.1	1 25 53.4	1.17	1.27
38 0	1 27 8.6	1 26 55.9	1 26 43.2	1 26 30.5	1 26 17.8	1 26 5.1	1.18	1.27
38 10	1 27 20.5	1 27 7.8	1 26 55.1	1 26 42.3	1 26 29.6	1 26 16.9	1.19	1.27
38 20	1 27 32.5	1 27 19.8	1 27 7.0	1 26 54.3	1 26 41.5	1 26 28.8	+1.20	−1.27
38 30	1 27 44.7	1 27 31.9	1 27 19.1	1 27 6.3	1 26 53.5	1 26 40.8	1.21	1.28
38 40	1 27 56.9	1 27 44.1	1 27 31.3	1 27 18.5	1 27 5.7	1 26 52.9	1.22	1.28
38 50	1 28 9.2	1 27 56.4	1 27 43.6	1 27 30.7	1 27 17.9	1 27 5.0	1.23	1.28
39 0	1 28 21.7	1 28 8.8	1 27 55.9	1 27 43.1	1 27 30.2	1 27 17.3	1.24	1.29
39 10	1 28 34.2	1 28 21.3	1 28 8.4	1 27 55.5	1 27 42.6	1 27 29.7	+1.25	−1.29
39 20	1 28 46.9	1 28 33.9	1 28 21.0	1 28 8.1	1 27 55.1	1 27 42.2	1.26	1.29
39 30	1 28 59.6	1 28 46.7	1 28 33.7	1 28 20.7	1 28 7.8	1 27 54.8	1.27	1.30
39 40	1 29 12.5	1 28 59.5	1 28 46.5	1 28 33.5	1 28 20.5	1 28 7.5	1.28	1.30
39 50	1 29 25.4	1 29 12.4	1 28 59.4	1 28 46.4	1 28 33.4	1 28 20.3	1.29	1.30
40 0	1 29 38.5	1 29 25.5	1 29 12.4	1 28 59.4	1 28 46.3	1 28 33.2	+1.30	−1.31

TABLE V.

AZIMUTH OF POLARIS AT ELONGATION, 1916.

Decl. / Lat.	88° 51′ 20″	88° 51′ 30″	88° 51′ 40″	88° 51′ 50″	88° 52′ 0″	88° 52′ 10″	Variation for— 1′ of Lat.	1″ of δ.
° ′	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	″	″
40 0	1 29 38.5	1 29 25.5	1 29 12.4	1 28 59.4	1 28 46.3	1 28 33.2	+1.30	−1.31
40 10	1 29 51.7	1 29 38.6	1 29 25.5	1 29 12.4	1 28 59.4	1 28 46.3	1.32	1.31
40 20	1 30 5.0	1 29 51.9	1 29 38.8	1 29 25.7	1 29 12.5	1 28 59.4	1.33	1.31
40 30	1 30 18.4	1 30 5.3	1 29 52.1	1 29 39.0	1 29 25.8	1 29 12.7	1.34	1.31
40 40	1 30 31.9	1 30 18.8	1 30 5.6	1 29 52.4	1 29 39.2	1 29 26.0	1.35	1.32
40 50	1 30 45.6	1 30 32.4	1 30 19.1	1 30 5.9	1 29 52.7	1 29 39.5	+1.36	−1.32
41 0	1 30 59.3	1 30 46.1	1 30 32.8	1 30 19.6	1 30 6.3	1 29 53.1	1.37	1.32
41 10	1 31 13.2	1 30 59.9	1 30 46.6	1 30 33.3	1 30 20.1	1 30 6.8	1.38	1.33
41 20	1 31 27.2	1 31 13.9	1 31 0.5	1 30 47.2	1 30 33.9	1 30 20.6	1.40	1.33
41 30	1 31 41.3	1 31 27.9	1 31 14.6	1 31 1.2	1 30 47.9	1 30 34.5	1.41	1.34
41 40	1 31 55.5	1 31 42.1	1 31 28.7	1 31 15.3	1 31 2.0	1 30 48.6	+1.42	−1.34
41 50	1 32 9.8	1 31 56.4	1 31 43.0	1 31 29.6	1 31 16.2	1 31 2.7	1.43	1.34
42 0	1 32 24.3	1 32 10.8	1 31 57.4	1 31 43.9	1 31 30.5	1 31 17.0	1.44	1.35
42 10	1 32 38.9	1 32 25.4	1 32 11.9	1 31 58.4	1 31 44.9	1 31 31.4	1.46	1.35
42 20	1 32 53.6	1 32 40.1	1 32 26.5	1 32 13.0	1 31 59.5	1 31 46.0	1.47	1.35
42 30	1 33 8.4	1 32 54.9	1 32 41.3	1 32 27.7	1 32 14.2	1 32 0.6	+1.48	−1.36
42 40	1 33 23.4	1 33 9.8	1 32 56.2	1 32 42.6	1 32 29.0	1 32 15.4	1.50	1.36
42 50	1 33 38.5	1 33 24.9	1 33 11.2	1 32 57.6	1 32 43.9	1 32 30.3	1.51	1.36
43 0	1 33 53.7	1 33 40.0	1 33 26.4	1 33 12.7	1 32 59.0	1 32 45.3	1.52	1.37
43 10	1 34 9.1	1 33 55.4	1 33 41.6	1 33 27.9	1 33 14.2	1 33 0.5	1.53	1.37
43 20	1 34 24.6	1 34 10.8	1 33 57.0	1 33 43.3	1 33 29.5	1 33 15.8	+1.55	−1.38
43 30	1 34 40.2	1 34 26.4	1 34 12.6	1 33 58.8	1 33 45.0	1 33 31.2	1.56	1.38
43 40	1 34 55.9	1 34 42.1	1 34 28.3	1 34 14.4	1 34 0.6	1 33 46.8	1.57	1.38
43 50	1 35 11.8	1 34 57.9	1 34 44.1	1 34 30.2	1 34 16.3	1 34 2.5	1.58	1.39
44 0	1 35 27.8	1 35 13.9	1 35 0.0	1 34 46.1	1 34 32.2	1 34 18.3	1.60	1.39
44 10	1 35 44.0	1 35 30.0	1 35 16.1	1 35 2.2	1 34 48.2	1 34 34.3	+1.61	−1.39
44 20	1 36 0.3	1 35 46.3	1 35 32.3	1 35 18.4	1 35 4.4	1 34 50.4	1.63	1.40
44 30	1 36 16.7	1 36 2.7	1 35 48.7	1 35 34.7	1 35 20.7	1 35 6.6	1.64	1.40
44 40	1 36 33.3	1 36 19.3	1 36 5.2	1 35 51.2	1 35 37.1	1 35 23.0	1.66	1.41
44 50	1 36 50.1	1 36 36.0	1 36 21.9	1 36 7.8	1 35 53.6	1 35 39.5	1.67	1.41
45 0	1 37 6.9	1 36 52.8	1 36 38.7	1 36 24.5	1 36 10.4	1 35 56.2	+1.68	−1.41
45 10	1 37 24.0	1 37 9.8	1 36 55.6	1 36 41.4	1 36 27.2	1 36 13.0	1.70	1.42
45 20	1 37 41.2	1 37 26.9	1 37 12.7	1 36 58.5	1 36 44.2	1 36 30.0	1.71	1.42
45 30	1 37 58.5	1 37 44.2	1 37 29.9	1 37 15.7	1 37 1.4	1 36 47.1	1.73	1.43
45 40	1 38 16.0	1 38 1.7	1 37 47.3	1 37 33.0	1 37 18.7	1 37 4.4	1.75	1.43
45 50	1 38 33.6	1 38 19.3	1 38 4.9	1 37 50.5	1 37 36.2	1 37 21.8	+1.76	−1.44
46 0	1 38 51.4	1 38 37.0	1 38 22.6	1 38 8.2	1 37 53.8	1 37 39.4	1.78	1.44
46 10	1 39 9.3	1 38 54.9	1 38 40.5	1 38 26.0	1 38 11.6	1 37 57.1	1.79	1.44
46 20	1 39 27.5	1 39 13.0	1 38 58.5	1 38 44.0	1 38 29.5	1 38 15.0	1.81	1.45
46 30	1 39 45.7	1 39 31.2	1 39 16.7	1 39 2.1	1 38 47.6	1 38 33.1	1.82	1.45
46 40	1 40 4.2	1 39 49.6	1 39 35.0	1 39 20.4	1 39 5.9	1 38 51.3	+1.84	−1.46
46 50	1 40 22.8	1 40 8.1	1 39 53.5	1 39 38.9	1 39 24.3	1 39 9.7	1.86	1.46
47 0	1 40 41.5	1 40 26.9	1 40 12.2	1 39 57.5	1 39 42.9	1 39 28.2	1.87	1.47
47 10	1 41 0.5	1 40 45.8	1 40 31.0	1 40 16.3	1 40 1.6	1 39 46.9	1.89	1.47
47 20	1 41 19.6	1 41 4.8	1 40 50.1	1 40 35.3	1 40 20.5	1 40 5.8	1.91	1.48
47 30	1 41 38.8	1 41 24.0	1 41 9.2	1 40 54.4	1 40 39.6	1 40 24.8	+1.92	−1.48
47 40	1 41 58.3	1 41 43.5	1 41 28.6	1 41 13.8	1 40 58.9	1 40 44.0	1.94	1.49
47 50	1 42 17.9	1 42 3.0	1 41 48.1	1 41 33.2	1 41 18.3	1 41 3.4	1.96	1.49
48 0	1 42 37.7	1 42 22.8	1 42 7.8	1 41 52.9	1 41 38.0	1 41 23.0	1.98	1.49
48 10	1 42 57.7	1 42 42.7	1 42 27.7	1 42 12.8	1 41 57.8	1 41 42.8	2.00	1.50
48 20	1 43 17.9	1 43 2.9	1 42 47.8	1 42 32.8	1 42 17.7	1 42 2.7	+2.02	−1.50
48 30	1 43 38.3	1 43 23.2	1 43 8.1	1 42 53.0	1 42 37.9	1 42 22.8	2.03	1.51
48 40	1 43 58.8	1 43 43.7	1 43 28.5	1 43 13.4	1 42 58.2	1 42 43.1	2.05	1.51
48 50	1 44 19.5	1 44 4.3	1 43 49.2	1 43 34.0	1 43 18.8	1 43 3.6	2.07	1.52
49 0	1 44 40.5	1 44 25.2	1 44 10.0	1 43 54.7	1 43 39.5	1 43 24.2	2.09	1.53
49 10	1 45 1.6	1 44 46.3	1 44 31.0	1 44 15.7	1 44 0.4	1 43 45.1	+2.11	−1.53
49 20	1 45 22.9	1 45 7.6	1 44 52.2	1 44 36.9	1 44 21.5	1 44 6.2	2.13	1.53
49 30	1 45 44.4	1 45 29.0	1 45 13.6	1 44 58.2	1 44 42.8	1 44 27.4	2.15	1.54
49 40	1 46 6.1	1 45 50.7	1 45 35.2	1 45 19.8	1 45 4.3	1 44 48.9	2.17	1.54
49 50	1 46 28.1	1 46 12.6	1 45 57.0	1 45 41.5	1 45 26.0	1 45 10.5	2.19	1.55
50 0	1 46 50.2	1 46 34.6	1 46 19.1	1 46 3.5	1 45 47.9	1 45 32.4	+2.21	−1.56

AZIMUTH OF POLARIS AT ELONGATION, 1916.

88° 51′ 20″	88° 51′ 30″	88° 51′ 40″	88° 51′ 50″	88° 52′ 0″	88° 52′ 10″	Variation for—	
						1′ of Lat.	1″ of δ.
° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	″	″
1 46 50.2	1 46 34.6	1 46 19.1	1 46 3.5	1 45 47.9	1 45 32.4	+2.21	−1.56
1 47 12.5	1 46 56.9	1 46 41.3	1 46 25.7	1 46 10.1	1 45 54.4	2.23	1.56
1 47 35.1	1 47 19.4	1 47 3.7	1 46 48.1	1 46 32.4	1 46 16.7	2.25	1.57
1 47 57.8	1 47 42.1	1 47 26.4	1 47 10.6	1 46 54.9	1 46 39.2	2.27	1.57
1 48 20.8	1 48 5.0	1 47 49.2	1 47 33.5	1 47 17.7	1 47 1.9	2.30	1.58
1 48 44.0	1 48 28.2	1 48 12.3	1 47 56.5	1 47 40.6	1 47 24.8	+2.32	−1.58
1 49 7.4	1 48 51.5	1 48 35.6	1 48 19.7	1 48 3.8	1 47 47.9	2.34	1.59
1 49 31.1	1 49 15.1	1 48 59.1	1 48 43.2	1 48 27.2	1 48 11.3	2.36	1.60
1 49 54.9	1 49 38.9	1 49 22.9	1 49 6.9	1 48 50.9	1 48 34.9	2.38	1.60
1 50 19.0	1 50 2.9	1 49 46.9	1 49 30.8	1 49 14.7	1 48 58.7	2.41	1.61
1 50 43.4	1 50 27.2	1 50 11.1	1 49 55.0	1 49 38.8	1 49 22.7	+2.43	−1.61
1 51 7.9	1 50 51.7	1 50 35.5	1 50 19.4	1 50 3.2	1 49 47.0	2.45	1.62
1 51 32.7	1 51 16.5	1 51 0.2	1 50 44.0	1 50 27.7	1 50 11.5	2.48	1.62
1 51 57.8	1 51 41.5	1 51 25.1	1 51 8.8	1 50 52.5	1 50 36.2	2.50	1.63
1 52 23.1	1 52 6.7	1 51 50.3	1 51 34.0	1 51 17.6	1 51 1.2	2.53	1.64
1 52 48.6	1 52 32.2	1 52 15.7	1 51 59.3	1 51 42.9	1 51 26.4	+2.55	−1.64
1 53 14.4	1 52 57.9	1 52 41.4	1 52 24.9	1 52 8.4	1 51 51.9	2.58	1.65
1 53 40.4	1 53 23.9	1 53 7.3	1 52 50.8	1 52 34.2	1 52 17.7	2.60	1.65
1 54 6.8	1 53 50.1	1 53 33.5	1 53 16.9	1 53 0.3	1 52 43.6	2.63	1.66
1 54 33.3	1 54 16.6	1 54 0.0	1 53 43.3	1 53 26.6	1 53 9.9	2.65	1.67
1 55 0.2	1 54 43.4	1 54 26.7	1 54 9.9	1 53 53.2	1 53 36.4	+2.68	−1.68
1 55 27.3	1 55 10.5	1 54 53.6	1 54 36.8	1 54 20.0	1 54 3.2	2.71	1.68
1 55 54.7	1 55 37.8	1 55 20.9	1 55 4.0	1 54 47.1	1 54 30.2	2.74	1.69
1 56 22.3	1 56 5.4	1 55 48.4	1 55 31.5	1 55 14.5	1 54 57.6	2.76	1.69
1 56 50.2	1 56 33.2	1 56 16.2	1 55 59.2	1 55 42.2	1 55 25.1	2.79	1.70
1 57 18.5	1 57 1.4	1 56 44.3	1 56 27.2	1 56 10.1	1 55 53.0	+2.82	−1.71
1 57 47.0	1 57 29.8	1 57 12.7	1 56 55.5	1 56 38.3	1 56 21.2	2.85	1.72
1 58 15.8	1 57 58.6	1 57 41.3	1 57 24.1	1 57 6.9	1 56 49.6	2.88	1.72
1 58 44.9	1 58 27.6	1 58 10.3	1 57 53.0	1 57 35.7	1 57 18.4	2.91	1.73
1 59 14.3	1 58 56.9	1 58 39.5	1 58 22.2	1 58 4.8	1 57 47.4	2.94	1.74
1 59 44.0	1 59 26.5	1 59 9.1	1 58 51.6	1 58 34.2	1 58 16.8	+2.97	−1.74
2 0 14.0	1 59 56.5	1 59 39.0	1 59 21.4	1 59 3.9	1 58 46.4	3.00	1.75
2 0 44.3	2 0 26.7	2 0 9.1	1 59 51.6	1 59 34.0	1 59 16.4	3.03	1.76
2 1 15.0	2 0 57.3	2 0 39.6	2 0 22.0	2 0 4.3	1 59 46.6	3.06	1.77
2 1 45.9	2 1 28.2	2 1 10.4	2 0 52.7	2 0 35.0	2 0 17.2	3.10	1.77
2 2 17.2	2 1 59.4	2 1 41.6	2 1 23.8	2 1 6.0	2 0 48.1	+3.13	−1.78
2 2 48.8	2 2 30.9	2 2 13.1	2 1 55.2	2 1 37.3	2 1 19.4	3.16	1.79
2 3 20.8	2 3 2.8	2 2 44.9	2 2 26.9	2 2 8.9	2 1 51.0	3.19	1.80
2 3 53.1	2 3 35.1	2 3 17.0	2 2 59.0	2 2 40.9	2 2 22.9	3.23	1.80
2 4 25.8	2 4 7.6	2 3 49.5	2 3 31.4	2 3 13.2	2 2 55.1	3.26	1.81
2 4 58.8	2 4 40.6	2 4 22.3	2 4 4.1	2 3 45.9	2 3 27.7	+3.30	−1.82
2 5 32.1	2 5 13.8	2 4 55.5	2 4 37.2	2 4 19.0	2 4 0.7	3.33	1.83
2 6 5.8	2 5 47.5	2 5 29.1	2 5 10.7	2 4 52.4	2 4 34.0	3.37	1.84
2 6 39.9	2 6 21.5	2 6 3.0	2 5 44.6	2 5 26.1	2 5 7.7	3.41	1.84
2 7 14.4	2 6 55.9	2 6 37.3	2 6 18.8	2 6 0.2	2 5 41.7	3.44	1.85
2 7 49.2	2 7 30.6	2 7 12.0	2 6 53.4	2 6 34.7	2 6 16.1	+3.48	−1.86
2 8 24.5	2 8 5.8	2 7 47.0	2 7 28.3	2 7 9.6	2 6 50.9	3.52	1.87
2 9 0.1	2 8 41.3	2 8 22.5	2 8 3.7	2 7 44.0	2 7 26.1	3.56	1.88
2 9 36.1	2 9 17.2	2 8 58.3	2 8 39.4	2 8 20.6	2 8 1.7	3.60	1.89
2 10 12.5	2 9 53.5	2 9 34.6	2 9 15.6	2 8 56.6	2 8 37.7	3.64	1.90
2 10 49.3	2 10 30.3	2 10 11.2	2 9 52.2	2 9 33.1	2 9 14.0	+3.68	−1.91
2 11 26.6	2 11 7.4	2 10 48.3	2 10 29.1	2 10 10.0	2 9 50.8	3.72	1.92
2 12 4.3	2 11 45.0	2 11 25.8	2 11 6.5	2 10 47.3	2 10 28.1	3.77	1.92
2 12 42.3	2 12 23.0	2 12 3.7	2 11 44.4	2 11 25.0	2 11 5.7	3.81	1.93
2 13 20.9	2 13 1.5	2 12 42.0	2 12 22.6	2 12 3.2	2 11 43.8	3.85	1.94
2 13 59.9	2 13 40.3	2 13 20.8	2 13 1.3	2 12 41.8	2 12 22.3	+3.90	−1.95
2 14 39.3	2 14 19.7	2 14 0.0	2 13 40.4	2 13 20.8	2 13 1.2	3.94	1.96
2 15 19.2	2 14 59.5	2 14 39.7	2 14 20.0	2 14 0.3	2 13 40.6	3.99	1.97
2 15 59.5	2 15 39.7	2 15 19.9	2 15 0.1	2 14 40.3	2 14 20.5	4.04	1.98
2 16 40.3	2 16 20.4	2 16 0.5	2 15 40.6	2 15 20.7	2 15 0.8	4.08	1.99
2 17 21.6	2 17 1.6	2 16 41.6	2 16 21.6	2 16 1.6	2 15 41.8	+4.13	−2.00

AZIMUTH OF POLARIS AT ELONGATION, 1916.

Decl. / Lat.	88° 51′ 20″	88° 51′ 30″	88° 51′ 40″	88° 51′ 50″	88° 52′ 0″	88° 52′ 10″	Variation for—	
							1′ of Lat.	1″ of δ.
° ′	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	″	″
60 0	2 17 21.6	2 17 1.6	2 16 41.6	2 16 21.6	2 16 1.6	2 15 41.6	+4.13	−2.00
60 10	2 18 3.4	2 17 43.3	2 17 23.2	2 17 3.1	2 16 43.0	2 16 22.9	4.18	2.01
60 20	2 18 45.7	2 18 25.5	2 18 5.3	2 17 45.1	2 17 24.9	2 17 4.6	4.23	2.02
60 30	2 19 28.5	2 19 8.2	2 18 47.9	2 18 27.6	2 18 7.2	2 17 46.9	4.28	2.03
60 40	2 20 11.8	2 19 51.4	2 19 31.0	2 19 10.6	2 18 50.1	2 18 29.7	4.33	2.04
60 50	2 20 55.7	2 20 35.1	2 20 14.6	2 19 54.1	2 19 33.5	2 19 13.0	+4.38	−2.05
61 0	2 21 40.0	2 21 19.4	2 20 58.7	2 20 38.1	2 20 17.5	2 19 56.8	4.44	2.07
61 10	2 22 24.9	2 22 4.2	2 21 43.4	2 21 22.7	2 21 1.9	2 20 41.2	4.49	2.08
61 20	2 23 10.4	2 22 49.5	2 22 28.6	2 22 7.8	2 21 46.9	2 21 26.1	4.54	2.09
61 30	2 23 56.4	2 23 35.4	2 23 14.4	2 22 53.5	2 22 32.5	2 22 11.5	4.60	2.10
61 40	2 24 43.0	2 24 21.9	2 24 0.8	2 23 39.7	2 23 18.6	2 22 57.5	+4.66	−2.11
61 50	2 25 30.1	2 25 8.9	2 24 47.7	2 24 26.5	2 24 5.3	2 23 44.1	4.72	2.12
62 0	2 26 17.9	2 25 56.6	2 25 35.3	2 25 13.9	2 24 52.6	2 24 31.3	4.78	2.13
62 10	2 27 6.2	2 26 44.8	2 26 23.4	2 26 1.9	2 25 40.5	2 25 19.1	4.84	2.14
62 20	2 27 55.2	2 27 33.7	2 27 12.1	2 26 50.6	2 26 29.0	2 26 7.4	4.90	2.16
62 30	2 28 44.8	2 28 23.1	2 28 1.4	2 27 39.8	2 27 18.1	2 26 56.4	+4.96	−2.17
62 40	2 29 35.0	2 29 13.2	2 28 51.4	2 28 29.6	2 28 7.8	2 27 46.0	5.02	2.18
62 50	2 30 25.9	2 30 4.0	2 29 42.0	2 29 20.1	2 28 58.2	2 28 36.3	5.09	2.19
63 0	2 31 17.4	2 30 55.4	2 30 33.3	2 30 11.3	2 29 49.2	2 29 27.2	5.16	2.20
63 10	2 32 9.6	2 31 47.4	2 31 25.3	2 31 3.1	2 30 40.9	2 30 18.8	5.22	2.22
63 20	2 33 2.5	2 32 40.2	2 32 17.9	2 31 55.6	2 31 33.3	2 31 11.0	+5.29	−2.23
63 30	2 33 56.0	2 33 33.6	2 33 11.2	2 32 48.8	2 32 26.3	2 32 3.9	5.36	2.24
63 40	2 34 50.3	2 34 27.8	2 34 5.2	2 33 42.6	2 33 20.1	2 32 57.5	5.43	2.26
63 50	2 35 45.3	2 35 22.6	2 34 59.9	2 34 37.2	2 34 14.5	2 33 51.8	5.50	2.27
64 0	2 36 41.1	2 36 18.2	2 35 55.4	2 35 32.6	2 35 9.7	2 34 46.9	5.58	2.28
64 10	2 37 37.5	2 37 14.6	2 36 51.6	2 36 28.6	2 36 5.7	2 35 42.7	+5.65	−2.30
64 20	2 38 34.8	2 38 11.7	2 37 48.6	2 37 25.5	2 37 2.4	2 36 39.3	5.73	2.31
64 30	2 39 32.8	2 39 9.6	2 38 46.3	2 38 23.1	2 37 59.8	2 37 36.6	5.81	2.32
64 40	2 40 31.6	2 40 8.2	2 39 44.9	2 39 21.5	2 38 58.1	2 38 34.7	5.89	2.34
64 50	2 41 31.3	2 41 7.7	2 40 44.2	2 40 20.7	2 39 57.1	2 39 33.6	5.97	2.35
65 0	2 42 31.7	2 42 8.0	2 41 44.4	2 41 20.7	2 40 57.0	2 40 33.3	+6.05	−2.37
65 10	2 43 33.0	2 43 9.2	2 42 45.4	2 42 21.5	2 41 57.7	2 41 33.9	6.13	2.38
65 20	2 44 35.2	2 44 11.2	2 43 47.2	2 43 23.2	2 42 59.3	2 42 35.3	6.22	2.40
65 30	2 45 38.2	2 45 14.1	2 44 50.0	2 44 25.8	2 44 1.7	2 43 37.6	6.31	2.41
65 40	2 46 42.2	2 46 17.9	2 45 53.6	2 45 29.3	2 45 5.0	2 44 40.7	6.40	2.43
65 50	2 47 47.0	2 47 22.6	2 46 58.1	2 46 33.7	2 46 9.2	2 45 44.8	+6.49	−2.44
66 0	2 48 52.8	2 48 28.2	2 48 3.6	2 47 39.0	2 47 14.4	2 46 49.8	6.58	2.46
66 10	2 49 59.5	2 49 34.8	2 49 10.0	2 48 45.2	2 48 20.5	2 47 55.7	6.68	2.48
66 20	2 51 7.2	2 50 42.3	2 50 17.4	2 49 52.4	2 49 27.5	2 49 2.6	6.78	2.49
66 30	2 52 15.9	2 51 50.8	2 51 25.7	2 51 0.6	2 50 35.5	2 50 10.4	6.88	2.51
66 40	2 53 25.7	2 53 0.4	2 52 35.1	2 52 9.8	2 51 44.6	2 51 19.3	+6.98	−2.53
66 50	2 54 36.4	2 54 11.0	2 53 45.5	2 53 20.1	2 52 54.6	2 52 29.2	7.09	2.54
67 0	2 55 48.2	2 55 22.6	2 54 57.0	2 54 31.4	2 54 5.7	2 53 40.1	7.19	2.56
67 10	2 57 1.1	2 56 35.3	2 56 9.5	2 55 43.7	2 55 17.9	2 54 52.1	7.30	2.58
67 20	2 58 15.1	2 57 49.1	2 57 23.2	2 56 57.2	2 56 31.2	2 56 5.2	7.41	2.60
67 30	2 59 30.3	2 59 4.1	2 58 37.9	2 58 11.8	2 57 45.6	2 57 19.4	+7.52	−2.62
67 40	3 0 46.5	3 0 20.2	2 59 53.8	2 59 27.5	2 59 1.2	2 58 34.8	7.64	2.63
67 50	3 2 4.0	3 1 37.5	3 1 10.9	3 0 44.4	3 0 17.9	2 59 51.3	7.76	2.65
68 0	3 3 22.7	3 2 56.0	3 2 29.2	3 2 2.5	3 1 35.8	3 1 9.0	7.88	2.67
68 10	3 4 42.6	3 4 15.7	3 3 48.8	3 3 21.8	3 2 54.9	3 2 28.0	8.01	2.69
68 20	3 6 3.8	3 5 36.7	3 5 9.6	3 4 42.4	3 4 15.3	3 3 48.2	+8.13	−2.71
68 30	3 7 26.3	3 6 58.9	3 6 31.6	3 6 4.3	3 5 37.0	3 5 9.7	8.26	2.73
68 40	3 8 50.1	3 8 22.5	3 7 55.0	3 7 27.5	3 7 0.0	3 6 32.4	8.40	2.75
68 50	3 10 15.2	3 9 47.5	3 9 19.8	3 8 52.0	3 8 24.3	3 7 56.6	8.53	2.77
69 0	3 11 41.8	3 11 13.8	3 10 45.9	3 10 17.9	3 9 50.0	3 9 22.1	8.67	2.79
69 10	3 13 9.7	3 12 41.6	3 12 13.4	3 11 45.3	3 11 17.1	3 10 49.0	+8.81	−2.81
69 20	3 14 39.1	3 14 10.8	3 13 42.4	3 13 14.0	3 12 45.7	3 12 17.3	8.96	2.84
69 30	3 16 10.1	3 15 41.5	3 15 12.9	3 14 44.3	3 14 15.7	3 13 47.1	9.11	2.86
69 40	3 17 42.5	3 17 13.7	3 16 44.9	3 16 16.0	3 15 47.2	3 15 18.4	9.26	2.88
69 50	3 19 16.5	3 18 47.5	3 18 18.4	3 17 49.4	3 17 20.3	3 16 51.3	9.42	2.90
70 0	3 20 52.1	3 20 22.8	3 19 53.6	3 19 24.3	3 18 55.0	3 18 25.7	+9.58	−2.93

TABLE Va.

FOR REDUCING TO ELONGATION OBSERVATIONS MADE NEAR ELONGATION.

Azimuth at Elong. / *Time.	1° 0′	1° 10′	1° 20′	1° 30′	1° 40′	1° 50′	2° 0′	2° 10′	Azimuth at Elong. / Time.*
m	″	″	″	″	″	″	″	″	m
0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
1	0.0	0.0	0.0	+ 0.1	+ 0.1	+ 0.1	+ 0.1	+ 0.1	1
2	+ 0.1	+ 0.2	+ 0.2	0.2	0.2	0.3	0.3	0.3	2
3	0.3	0.4	0.4	0.5	0.5	0.6	0.6	0.7	3
4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	4
5	+ 0.9	+ 1.0	+ 1.1	+ 1.3	+ 1.4	+ 1.6	+ 1.7	+ 1.9	5
6	1.2	1.4	1.6	1.8	2.1	2.3	2.5	2.7	6
7	1.7	2.0	2.2	2.5	2.8	3.1	3.4	3.7	7
8	2.2	2.6	2.9	3.3	3.7	4.0	4.4	4.8	8
9	2.8	3.2	3.7	4.2	4.6	5.1	5.6	6.0	9
10	+ 3.4	+ 4.0	+ 4.6	+ 5.1	+ 5.7	+ 6.3	+ 6.9	+ 7.4	10
11	4.1	4.8	5.5	6.2	6.9	7.6	8.3	9.0	11
12	4.9	5.8	6.6	7.4	8.2	9.0	9.9	10.7	12
13	5.8	6.8	7.7	8.7	9.7	10.6	11.6	12.6	13
14	6.7	7.8	9.0	10.1	11.2	12.3	13.4	14.6	14
15	+ 7.7	+ 9.0	+10.3	+11.6	+12.8	+14.1	+15.4	+16.7	15
16	8.8	10.2	11.7	13.2	14.6	16.1	17.5	19.0	16
17	9.9	11.5	13.2	14.9	16.5	18.2	19.8	21.5	17
18	11.1	12.9	14.8	16.7	18.5	20.4	22.2	24.1	18
19	12.4	14.4	16.5	18.6	20.6	22.7	24.7	26.8	19
20	+13.7	+16.0	+18.3	+20.6	+22.8	+25.1	+27.4	+29.7	20
21	15.1	17.6	20.1	22.7	25.2	27.7	30.2	32.7	21
22	16.6	19.3	22.1	24.9	27.6	30.4	33.2	35.9	22
23	18.1	21.1	24.2	27.2	30.2	33.2	36.2	39.3	23
24	19.7	23.0	26.3	29.6	32.9	36.2	39.5	42.8	24
25	+21.4	+25.0	+28.5	+32.1	+35.7	+39.2	+42.8	+46.4	25

Azimuth at Elong. / Time.	2° 10′	2° 20′	2° 30′	2° 40′	2° 50′	3° 0′	3° 10′	3° 20′	Azimuth at Elong. / Time.*
m	″	″	″	″	″	″	″	″	m
0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
1	+ 0.1	+ 0.1	+ 0.1	+ 0.1	+ 0.1	+ 0.1	+ 0.1	+ 0.1	1
2	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.5	2
3	0.7	0.7	0.8	0.8	0.9	0.9	1.0	1.0	3
4	1.2	1.3	1.4	1.5	1.6	1.6	1.7	1.8	4
5	+ 1.9	+ 2.0	+ 2.1	+ 2.3	+ 2.4	+ 2.6	+ 2.7	+ 2.9	5
6	2.7	2.9	3.1	3.3	3.5	3.7	3.9	4.1	6
7	3.7	3.9	4.2	4.5	4.8	5.0	5.3	5.6	7
8	4.8	5.1	5.5	5.9	6.2	6.6	7.0	7.3	8
9	6.0	6.5	7.0	7.4	7.9	8.3	8.8	9.3	9
10	+ 7.4	+ 8.0	+ 8.6	+ 9.2	+ 9.7	+10.3	+10.9	+11.4	10
11	9.0	9.7	10.4	11.1	11.8	12.4	13.1	13.8	11
12	10.7	11.5	12.3	13.2	14.0	14.8	15.6	16.5	12
13	12.6	13.5	14.5	15.4	16.4	17.4	18.4	19.3	13
14	14.6	15.7	16.8	17.9	19.0	20.2	21.3	22.4	14
15	+16.7	+18.0	+19.3	+20.6	+21.9	+23.1	+24.4	+25.7	15
16	19.0	20.5	21.9	23.4	24.9	26.3	27.8	29.3	16
17	21.5	23.1	24.8	26.4	28.1	29.7	31.4	33.0	17
18	24.1	25.9	27.8	29.6	31.5	33.3	35.2	37.0	18
19	26.8	28.9	30.9	33.0	35.1	37.1	39.2	41.3	19
20	+29.7	+32.0	+34.3	+36.6	+38.8	+41.1	+43.4	+45.7	20
21	32.7	35.3	37.8	40.3	42.8	45.3	47.9	50.4	21
22	35.9	38.7	41.5	44.2	47.0	49.8	52.5	55.3	22
23	39.3	42.3	45.3	48.3	51.4	54.4	57.4	60.4	23
24	42.8	46.0	49.3	52.6	55.9	59.2	62.5	65.8	24
25	+46.4	+49.9	+53.5	+57.1	+60.7	+64.2	+67.8	+71.4	25

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* Sidereal time from elongation.

TABLE VI.

FOR FINDING THE TIMES OF UPPER AND LOWER CULMINATION OF POLARIS, 1916, FROM THE OBSERVED TIMES WHEN THE STAR IS ON THE SAME VERTICAL CIRCLE WITH THE STARS ζ URSÆ MAJORIS (MIZAR) *SUB POLO* AND δ CASSIOPEIÆ *SUB POLO*, RESPECTIVELY.

Except at high latitudes, the pole star at either upper or lower culmination furnishes a simple and convenient method for laying down a meridian line on the earth's surface at points in the northern hemisphere. When the local time is unknown and accurate astronomical instruments are not available, the time of culmination of Polaris may be found by observing the instant when Polaris is vertically above (has the same azimuth as) ζ Ursæ Majoris (Mizar) below the pole, or δ Cassiopeiæ below the pole. In the former case, for the year 1916, Polaris is approaching upper culmination and in the latter case it is approaching lower culmination. The mean time interval which elapses between the observed times above mentioned and upper or lower culmination, as the case may be, are given for ζ Ursæ Majoris and δ Cassiopeiæ for ten-day intervals in the following table. This method can not be used at places south of 30° north latitude.

ζ URSÆ MAJORIS (MIZAR).
(Upper culmination of Polaris.)

Date. \ Lat.	40°	45°	50°	55°	60°
	m s	m s	m s	m s	m s
Jan. 1	8 51	8 50	8 48	8 45	8 42
11	8 41	8 39	8 37	8 35	8 31
21	8 30	8 29	8 27	8 24	8 21
31	8 20	8 19	8 17	8 14	8 11
Feb. 10	8 10	8 8	8 7	8 4	8 1
20	8 1	7 59	7 57	7 55	7 52
Mar. 1	7 53	7 52	7 50	7 48	7 45
June 30	8 37	8 35	8 33	8 31	8 28
July 10	8 48	8 46	8 44	8 42	8 38
20	8 59	8 57	8 55	8 52	8 49
30	9 10	9 8	9 6	9 3	9 0
Aug. 9	9 21	9 19	9 17	9 14	9 10
19	9 30	9 28	9 26	9 23	9 20
29	9 38	9 37	9 34	9 31	9 28
Sept. 8	9 46	9 45	9 42	9 39	9 36
18	9 53	9 51	9 49	9 46	9 42
28	9 58	9 56	9 53	9 51	9 47
Oct. 8	10 1	9 59	9 57	9 54	9 50
18	10 4	10 2	9 59	9 56	9 53
28	10 4	10 2	9 59	9 57	9 53
Nov. 7	10 2	10 0	9 58	9 55	9 51
17	9 59	9 57	9 55	9 52	9 48
27	9 54	9 52	9 50	9 47	9 44
Dec. 7	9 48	9 46	9 43	9 41	9 37
17	9 39	9 37	9 35	9 32	9 29
27	9 31	9 29	9 27	9 24	9 20
31	9 27	9 25	9 23	9 20	9 17

δ CASSIOPEIÆ.
(Lower culmination of Polaris.)

Date. \ Lat.	35°	40°	45°	50°	55°
	m s	m s	m s	m s	m s
Jan. 1	9 58	9 59	10 1	10 3	10 6
11	9 47	9 48	9 50	9 52	9 55
21	9 36	9 38	9 40	9 42	9 44
31	9 26	9 28	9 29	9 31	9 34
Feb. 10	9 16	9 17	9 19	9 21	9 23
20	9 6	9 7	9 9	9 11	9 13
Mar. 2	8 57	8 59	9 1	9 3	9 5
12	8 51	8 53	8 55	8 57	8 59
22	8 47	8 48	8 50	8 52	8 54
Apr. 1	8 45	8 46	8 48	8 50	8 52
11	8 45	8 46	8 48	8 50	8 52
21	8 47	8 48	8 50	8 52	8 54
May 1	8 50	8 52	8 53	8 55	8 58
11	8 56	8 57	8 59	9 1	9 3
21	9 4	9 5	9 7	9 9	9 11
31	9 12	9 14	9 15	9 17	9 20
June 10	9 21	9 23	9 24	9 26	9 29
20	9 32	9 33	9 35	9 37	9 40
30	9 43	9 45	9 47	9 49	9 52
July 10	9 54	9 56	9 58	10 0	10 3
20	10 5	10 7	10 9	10 11	10 14
30	10 17	10 18	10 20	10 23	10 26
Nov. 27	11 2	11 4	11 6	11 9	11 12
Dec. 7	10 55	10 57	10 59	11 2	11 5
17	10 47	10 49	10 51	10 53	10 56
27	10 38	10 40	10 42	10 44	10 47
31	10 34	10 35	10 37	10 40	10 43

APPARENT PLACE, TIME OF UPPER CULMINATION, AND TIME INTERVAL BETWEEN UPPER CULMINATION AND ELONGATION EAST OR WEST, OF POLARIS, 1916.

The local mean time of culmination on any meridian for a given date is found by taking from the following table the *Mean Time* of the nearest Greenwich culmination, and applying to it the product of the *Var. per Day* by the integral number of intervening days, this product being numerically additive for an earlier date and subtractive for a later date than that given in the table; and by applying also the product of the *Var. per Hour* by the longitude from Greenwich expressed in hours and fractions of an hour, this product being numerically additive for East longitudes and subtractive for West longitudes.

The time interval between upper and lower culmination is 12^h diminished by one-half the numerical value of the *Var. per Day*.

The last column below applies to all meridians.

Date.	Upper Culmination, Meridian of Greenwich.					Latitude.	Mean Time Interval, Elongation *minus* Upper Culm.
	Apparent Right Ascension.	Apparent Declination.	Mean Time.	Var. per Day.	Var. per Hour.		
	h m 1 28 s	° ′ +88 51 ″	h m s	m s	W. E. s	°	W. E. h m
Jan. 1	111	51.8	6 49 28	−3 57.0	−9.88+	10	+5 58.2−
11	100	52.9	6 9 58	3 57.0	9.87	12	5 58.1
21	90	53.4	5 30 28	3 56.9	9.87	14	5 57.9
31	80	53.0	4 50 59	3 56.9	9.87	16	5 57.7
Feb. 10	70	52.0	4 11 30	3 56.9	9.87	18	5 57.5
20	60	50.6	3 32 1	−3 56.8	−9.87+	20	+5 57.4−
Mar. 1	53	48.6	2 52 35	3 56.6	9.86	22	5 57.2
11	46	46.0	2 13 10	3 56.5	9.85	24	5 57.0
21	41	43.2	1 33 45	3 56.3	9.84	26	5 56.8
31	39	40.3	0 54 24	3 56.0	9.83	28	5 56.6
Apr. 10	39	37.1	0 15 5	−3 55.8	−9.83+	30	+5 56.4−
19	40	34.0	23 35 47	3 55.7	9.82	32	5 56.2
29	43	31.1	22 56 31	3 55.5	9.81	34	5 56.0
May 9	49	28.6	22 17 18	3 55.3	9.80	36	5 55.7
19	56	26.2	21 38 6	3 55.1	9.80	38	5 55.5
29	64	24.2	20 58 55	−3 55.0	−9.79+	40	+5 55.2−
June 8	74	22.9	20 19 45	3 54.9	9.79	42	5 54.9
18	85	22.1	19 40 37	3 54.8	9.78	44	5 54.6
28	96	21.6	19 1 29	3 54.8	9.78	46	5 54.3
July 8	107	21.7	18 22 20	3 54.8	9.78	48	5 54.0
18	118	22.6	17 43 12	−3 54.8	−9.78+	50	+5 53.6−
28	130	23.8	17 4 5	3 54.8	9.78	52	5 53.2
Aug. 7	140	25.4	16 24 56	3 54.9	9.79	54	5 52.8
17	150	27.7	15 45 47	3 55.0	9.79	56	5 52.3
27	159	30.4	15 6 37	3 55.0	9.79	58	5 51.8
Sept. 6	168	33.3	14 27 27	−3 55.1	−9.80+	60	+5 51.2−
16	174	36.5	13 48 14	3 55.3	9.80	62	5 50.5
26	179	40.1	13 9 0	3 55.4	9.81	64	5 49.7
Oct. 6	184	43.9	12 29 46	3 55.6	9.82	66	5 48.8
16	187	47.6	11 50 29	3 55.8	9.82	68	5 47.8
26	187	51.4	11 11 10	−3 56.0	−9.83+	70	+5 46.5−
Nov. 5	186	55.2	10 31 50	3 56.1	9.84		
15	183	58.8	9 52 29	3 56.3	9.84		
25	179	62.0	9 13 5	3 56.5	9.85		
Dec. 5	172	65.0	8 33 39	3 56.6	9.86		
15	165	67.6	7 54 13	−3 56.7	−9.86+		
25	156	69.6	7 14 45	−3 56.8	−9.87+		

ON THE ARRANGEMENT AND USE OF THE AMERICAN EPHEMERIS AND NAUTICAL ALMANAC.

There are in general use three different kinds of time, True Solar Time—also called Apparent Solar Time—Mean Solar Time, and Sidereal Time.

True or Apparent Solar Time is measured by the diurnal motion of the Sun, the length of the day being the interval between two successive transits of the Sun over the same meridian, and the time of day being the hour-angle of the Sun westward from the meridian. Owing to the obliquity of the ecliptic and to the lack of uniformity of the motion of the Earth in its orbit, the rate of motion of the Sun in hour-angle and the length of the apparent solar day are not constant. Therefore clocks and chronometers can not be regulated to apparent solar time, which may, however, be determined by observations of the Sun when visible.

Mean Solar Time is measured by the motion of a fictitious body called the mean Sun, which is supposed to move uniformly in the celestial equator, completing the circuit in one tropical year. Since mean solar time is uniform and regular in its passage, clocks and watches may be regulated to it, and those in ordinary use are usually so regulated.

Mean solar time can not, of course, be determined by direct observation, but may be determined indirectly by correcting observations of the Sun for the equation of time, or by converting to mean time sidereal time determined by observations of fixed stars.

The Equation of Time is the difference in hour-angle between the true Sun and the mean Sun. The true Sun is sometimes before and sometimes behind the mean Sun by an amount which varies from zero to about 16 minutes. The equation of time is given for Greenwich mean noon on pages 2–16 and for Washington apparent noon on pages 514–521.

The Mean Solar Day is the unit of mean solar time, and is equal in length to the mean or average of all the true or apparent solar days of the year. It may be otherwise defined as the interval of time elapsing between two successive transits of the mean Sun across the meridian of any place.

Sidereal Time or star time, in general terms, is measured by the diurnal motion of the fixed stars, or, speaking more precisely, by the diurnal motion of that point on the celestial equator called the vernal equinox, from which the right ascensions of the heavenly bodies are measured. Astronomical clocks regulated to sidereal time are called sidereal clocks. Sidereal time may be determined from observations of stars whose right ascensions are known.

A Sidereal Day is very nearly the length of time in which the Earth rotates on its axis and is accurately defined as the time interval between two successive transits of the vernal equinox over the same meridian. The sidereal day is shorter than the mean solar day by $3^m\ 56^s.555$ sidereal time or $3^m\ 55^s.909$ mean solar time, the tropical year of 365.2422 mean solar days containing 366.2422 sidereal days. Sidereal time and the length of the sidereal day are subject to slight irregularities on account of small differences between the positions of the true and mean equinoxes.

The mean solar and sidereal days are each divided into 24 hours. About March 23 (civil date) of each year, about two days after the vernal equinox, there is an instant when the face of a sidereal clock shows the same time as a mean time clock, and the former gains on the latter $3^m\ 56^s.555$ sidereal time per mean solar day, so that at the end of a year it will have gained one sidereal day and will again agree with the mean time clock.

The Civil Day begins at midnight and comprises 24 hours, the hours being counted from 0 to 12 in two series; the first, marked A. M., running from midnight to noon, and the second, marked P. M., running from noon to midnight.

The Astronomical Day begins at noon on the civil day of the same date, the 24 hours being counted from 0 to 24, running from noon of one day to noon of the next following day. Astronomical time as well as civil time may be either apparent or mean.

The civil day begins twelve hours before the astronomical day; therefore the first half of the civil day coincides with the last half of the preceding astronomical day, and the last half of the civil day coincides with the first half of the astronomical day of the same date. Hence we have the following rules:

To convert Civil Time into Astronomical Time.—If the civil time is marked A. M., take one from the day and add twelve to the hours; if the civil time is marked P. M., take away the designation P. M. Thus, January 9, 2 o'clock, A. M., civil time, is January 8, 14^h, astronomical time; and January 9, 2 o'clock, P. M., civil time, is January 9, 2^h, astronomical time.

To convert Astronomical Time into Civil Time.—If the astronomical time is less than twelve hours, write P. M. after it; if greater than twelve hours, subtract twelve hours from it, mark the result A. M., and add one to the day.

To convert Solar or Sidereal Time of any meridian B to that of another meridian A, add the difference of longitude expressed in time when A is east of B, and subtract the difference of longitude when A is west of B.

Greenwich mean time, which at any fixed observatory is obtained by applying the longitude to the local mean time, on board ship is usually taken from the mean time chronometer set to Greenwich time.

Greenwich mean noon of any date means the noon at the beginning of the astronomical day.

PART I.—THE EPHEMERIS FOR THE MERIDIAN OF GREENWICH.

Pages 2–17 contain for Greenwich mean noon of each day the *Sun's Apparent Right Ascension, Apparent Declination, Semidiameter, Horizontal Parallax, True Longitude, and Latitude.* They also contain the *Logarithm of the Radius Vector of the Earth,* the *Precession in Longitude,* the *Nutation in Longitude,* the *Aberration,* the *True Obliquity,* the *Equation of Time,* the *Sidereal Time or Right Ascension of Mean Sun,* and the *Mean Time of Sidereal Noon.* Adjoining columns contain, for each Greenwich mean noon, the *Variation per*

Hour for those of the quantities for which it seemed advisable to give a rate of motion. By multiplying any one of those variations by the hours and parts of an hour from Greenwich mean noon and adding the product algebraically to the corresponding quantity at noon, we obtain an approximate value of the quantity in question for any given Greenwich mean time. If great exactness is desired, the value of the hourly variation is found for the time halfway between Greenwich mean noon and the given Greenwich mean time before multiplying by the hours and parts of an hour from Greenwich mean noon.

It is to be noted that here, as elsewhere throughout the volume, the positive sign used with declinations or latitudes indicates north and the negative sign south.

The Sun's *Apparent Right Ascension* and *Declination* are affected both by aberration and by nutation, and therefore denote the *apparent* position of the *true* Sun. The Sun's *True Longitude* is the true geometric longitude not corrected for aberration; it is referred to the true equinox.

The Sun's *Latitude* is referred to the ecliptic of the date.

The Sun's *Declination* is required whenever that body is observed for the purpose of finding latitude, local time, or azimuth.

The Sun's *Semidiameter* is used in reducing the altitude of the upper or lower limb of the Sun to the altitude of the center; and in reducing the angular distance between the limb of the Sun and any other object to the distance from the center of the Sun.

The *Horizontal Parallax* is the angle subtended by the equatorial radius of the Earth, as seen from the center of the Sun.

The *Precession in Longitude* is the quantity to be applied to the longitude of the Sun referred to the mean equinox of the beginning of the Besselian fictitious year, i. e., the instant when the Sun's mean longitude is 280°, in order to refer it to the mean equinox of date.

The *Nutation in Longitude* is the quantity to be applied to the longitude of a body referred to the mean equinox of date in order to refer it to the true equinox, short-period terms being neglected.

The *Aberration* is the quantity to be subtracted from the true longitude of the Sun in order to obtain its apparent longitude.

The *True Obliquity* is the inclination of the Earth's equator to the ecliptic, short-period terms being neglected.

The corrections to the values of the nutation and the obliquity here given, to take account of the short-period terms, may be found on pages 215–216.

The *Equation of Time* is the apparent time of Greenwich mean noon, or the hour angle of the true Sun at that instant. When interpolated to any given Greenwich mean time, it is the correction to be applied to mean time in order to obtain apparent time.

The *Sidereal Time of Mean Noon* is the right ascension of the mean Sun at Greenwich mean noon. It may be reduced for the longitude or to any Greenwich mean time by using the hourly variation, $+9^s.8565$; or by Table III, page 691 of this volume, for reducing intervals of mean time to sidereal time. It is useful in converting mean time to sidereal time. We first find the Greenwich mean time, then the right ascension of the mean Sun for that time, and this being added to the local astronomical mean time, i. e., the hour angle of the mean Sun, will give the hour angle of the vernal equinox, or the sidereal time required.

The sidereal time of mean noon, reduced for the longitude of the place, is also used in converting sidereal time to mean time. Subtracting the reduced value from the given sidereal time gives the interval of sidereal time past noon, and that is converted into the required mean time by subtracting from it the corresponding reduction of a sidereal interval to a mean-time interval, taken from Table II, page 688 of this volume. If the sidereal interval is less than $3^m\ 56^s.555$, there are two mean times corresponding to the given sidereal time, one a few minutes after the preceding noon, and the other a few minutes before the following noon, the mean time interval between these two mean times being $23^h\ 56^m\ 4^s.09$. The mean time, approximately known, will always show which one is to be taken. Instead of using Table II, the reduction of a sidereal to a mean time interval may be found by multiplying $-9^s.8296$ by the hours and parts of an hour of the sidereal interval.

The *Mean Time of Sidereal Noon* is the number of hours, minutes, and seconds after Greenwich mean noon when the vernal equinox passes the meridian of Greenwich; it may be reduced to any other meridian by using the hourly variation, $-9^s.8296$, to effect the necessary interpolation, or the reduction may be taken directly from Table II. In the same way the reduction may be made to any Greenwich sidereal time, and the result will then represent $24^h -$ Right Ascension of the Mean Sun. This column may be conveniently used for converting sidereal to mean time, or—which is the same problem—for finding the time of meridian passage of a star whose right ascension is known, by adding to the mean time of the *preceding* local sidereal noon, the mean time equivalent of the given sidereal time.

As examples of the use of pages 2–17:

1. Let the Sun's declination be required for 1916, April 14, $2^h\ 5^m\ 20^s$, P. M., at a place whose longitude is 58° 20′, or $3^h\ 53^m\ 20^s$ west from Greenwich:

		h m s
Local mean time	April 14,	2 5 20
Longitude from Greenwich (additive) . .		3 53 20
Greenwich mean time . . .	April 14,	5 58 40

Reducing the minutes and seconds to decimals of an hour, we find that this moment is $5^h.978$ after Greenwich mean noon on April 14, or $18^h.022$ before Greenwich mean noon on April 15.

On page 6 of the Ephemeris we find that the variation of declination per hour is:

	″
At Greenwich mean noon, April 14	+54.00
At Greenwich mean noon, April 15	+53.60
Difference for one day	− 0.40

If great exactness is desired, we find the amount of this hourly variation for the time halfway between Greenwich noon and the time of observation; that is, for 3 hours after Greenwich noon of the 14th, this being half of 6 hours. Three hours is 0.125 of a day; so the calculation is as follows:

	″
Variation at Greenwich mean noon, April 14	+54.00
Change for 0.125 of a day, or $-0''.40\times0.125$	− 0.05
Variation at 3 hours after noon	+53.95

$+53''.95\times5.978=+322''.5=+5'\,22''.5$

	°	′	″
Declination at Greenwich noon, April 14	+9	23	25.2
Variation in 5.978 hours	+	5	22.5
Sun's declination at time of observation	+9	28	47.7

With equal facility the computation might have been made backward from the succeeding noon. Thus in the example just given the time is 18$^{\rm h}$.022 before Greenwich noon of April 15; half this interval is about 0.375 of a day, and the hourly motion for the middle of the interval is $+53''.75$. Then we find:

	°	′	″
Declination at Greenwich noon, April 15	+9	44	56.5
Product of $+53''.75\times-18.022=-968''.7$	−	16	8.7
Sun's declination at time of observation	+9	28	47.8

It will always be well to make the calculation in both ways, as a check; but if the results differ slightly the one derived from the nearest noon should be regarded as the more accurate.

2. Let the Sun's right ascension and the equation of time be required for 1916, July 13, 10$^{\rm h}$ 3$^{\rm m}$ 30$^{\rm s}$, A. M., mean time, at a place whose longitude is 85° 15′, or 5$^{\rm h}$ 41$^{\rm m}$ west from Greenwich.

		h	m	s	h
Local astronomical mean time	July 12,	22	3	30	
Longitude from Greenwich (additive)		5	41	0	
Greenwich mean time	July 13,	3	44	30	=3.7417

Sun's Right Ascension.

		h	m	s
Greenwich noon, July 13		7	29	38.86
H. V. 10$^{\rm s}$.150×3.7417	+			37.98
		7	30	16.84

Equation of Time.

	m	s
Greenwich noon, July 13	−5	30.80
H. V. −0$^{\rm s}$.294×3.7417	−	1.10
	−5	31.90

In this case the hourly variations interpolated to half the interval, or 1$^{\rm h}$.87 after noon, have been used.

3. If the sidereal time is required for the same time and place, we have:

		h	m	s
Sidereal time at Greenwich mean noon, July 13		7	24	8.06
Reduction for 3$^{\rm h}$ 44$^{\rm m}$ 30$^{\rm s}$ from Table III, or 9$^{\rm s}$.8565×3.7417	+			36.88
Add the local astronomical mean time		22	3	30.00
The required sidereal time (rejecting 24$^{\rm h}$)		5	28	14.94

4. On 1916, July 13, A. M., at a place whose longitude is 85° 15′ W., suppose the sidereal time to be 5$^{\rm h}$ 28$^{\rm m}$ 14$^{\rm s}$.94 and that the corresponding mean time is required.

The astronomical day is July 12; the longitude in time, $+5^h\ 41^m\ 0^s$, or $+5^h.6833$.

First solution.

	h	m	s	h
Sidereal time at Greenwich mean noon, July 12 . . .	7	20	11.50	
Reduction for $5^h\ 41^m\ 0^s$ from Table III, or $9^s.8565\times5.6833$.			+56.02	
The sidereal time at local mean noon, July 12 . . .	7	21	7.52	
The given sidereal time ($+24^h$, if necessary for the following subtraction)	29	28	14.94	
Subtracting the first from the second gives the sidereal interval from noon	22	7	7.42	=22.1187
Reduction for $22^h\ 7^m\ 7^s.42$ from Table II, or $-9^s.8296\times22.1187$		−3	37.42	
The required astronomical mean time . . July 12,	22	3	30.00	

Second solution.

		h	m	s
Mean time at Greenwich sidereal noon . .	July 12,	16	37	4.70
Reduction for longitude from Table II, or $-9^s.8296\times5.6833$.				− 55.86
Mean time of *preceding* local sidereal noon . .	July 12,	16	36	8.84
Add the given sidereal time		5	28	14.94
Reduction for $5^h\ 28^m\ 14^s.94$ from Table II, or $-9^s.8296\times5.4708$				− 53.78
The required astronomical mean time . . .	July 12,	22	3	30.00

If there is any doubt about the mean time of the *preceding* local sidereal noon, the first solution is to be preferred.

Pages 18–25 contain the rectangular coordinates of the Sun, referred to the center of the Earth as the origin, and to the true equator and equinox as the plane and point of reference. Each coordinate is given for every Greenwich mean noon and midnight. The columns *Reduc. to Mean Eq'x of 1916.0* give the corrections to be applied to the coordinates for noon in order to obtain the corresponding coordinates referred to the mean equator and equinox of the beginning of the Besselian fictitious year.

Pages 26–117 contain *The Moon's Right Ascension* and *Declination* for each day and hour of Greenwich mean time, referred to the true equator and equinox. They are accompanied by columns of *Variations per Minute*, by means of which, interpolation may be conveniently made to any moment of Greenwich mean time. The right ascension or declination is taken out for the given day and hour of Greenwich mean time; the *Var. per Min.* is multiplied by the minutes and parts of a minute of the Greenwich time, and the product is added numerically in case of the right ascension and algebraically in case of the declination.

Thus, suppose the Moon's right ascension and declination are required for 1916, January 25, $10^h\ 10^m\ 30^s$, astronomical mean time at Greenwich:

	Right Ascension. h m s		*Declination.* ° ′ ″
January 25, 10^h	12 23 42.84		−7 34 59.9
Var. $1^s.9777\times10.5$ . .	20.77	$-14''.346\times10.5$	−2 30.6
January 25, $10^h\ 10^m\ 30^s$.	12 24 3.61		−7 37 30.5

For the sake of precision, the differences here employed have been interpolated for $5^m.2=0^h.09$.

Page 117 contains also the *Phases of the Moon* and the dates of the *Moon's Apogee* and *Perigee,* or greatest and least distances from the Earth.

Pages 118–133 contain for every Greenwich mean noon and midnight the *Moon's Longitude* and *Latitude* referred to the true equinox and the ecliptic, its *Semidiameter*, and its *Equatorial Horizontal Parallax.* The column adjoining that of the horizontal parallax gives the variation of that quantity per hour, by means of which it can be reduced to any other Greenwich mean time in the manner shown in the preceding examples. When allowing for change in the variation itself, note must be taken of the fact that the tabular interval is here 12 hours instead of 24. The quantity thus obtained is the equatorial horizontal parallax; to obtain the horizontal parallax at any given place, the correction for the latitude of the place must be applied. The reduction of the Moon's semidiameter may be readily found by multiplying the reduction of the horizontal parallax by 0.2725 (see page xiii), or by simply computing the proportional part.

If, for example, the semidiameter of the Moon is to be taken out for 1916, March 10, 7^h, P. M., Greenwich mean time, we see that the difference of the semidiameters at noon and midnight of March 10 is 2″.9; then,

$$12^h : 7^h = 2''.9 : 1''.7$$

which is the correction to be subtracted from the semidiameter at noon, because the semidiameter is decreasing. The Moon's semidiameter for March 10, 7^h, is therefore 14′ 53″.5.

The Moon's semidiameter and horizontal parallax are required for all observations of the Moon.

Pages 118–133 contain also: The *Moon's Age*, or the time elapsed since the preceding new Moon, given to tenths of a day; the mean time of the *Moon's Transit, Upper* and *Lower*, at Greenwich, given to tenths of a minute; and the *Variation per Hour* of the latter quantity, that is, the variation for one hour of longitude, by means of which the local time of an upper or lower transit of the Moon may be computed for any place whose longitude is known.

Pages 134–198 contain for each of the seven major planets the geocentric ephemeris followed immediately by the heliocentric ephemeris.

The geocentric ephemeris gives the planet's *Apparent Right Ascension* and *Apparent Declination* with the respective *Variations per Hour* or *per Day.* The positions thus given are referred to the true equator and equinox, and are corrected for aberration. The geocentric ephemeris gives also the *Logarithm of Distance from Earth* with the *Variation per Hour* or *per Day*, the planet's *Semidiameter* and *Horizontal Parallax*, and, to tenths of a minute, the time of *Transit, Meridian of Greenwich.* All the data, except the last named, are given for Greenwich mean noon.

The right ascension and declination of a planet are required whenever it is observed for time, latitude, or azimuth. The mode of reducing the ephemeris positions of planets to other instants of Greenwich mean time is the same as that already given for the Sun. The local mean time of meridian transit of any planet at any place can be found by dividing the proper daily difference of the ephemeris times by 24, multiplying the quotient by the longitude of the place expressed in hours and fractions, and applying the product with its proper sign to the time of Greenwich transit.

The heliocentric ephemeris gives the *Heliocentric Longitude, Mean Equinox of Date;* the *Heliocentric Latitude;* and the *Logarithm of Radius Vector;* with their respective *Variations per Day.* The heliocentric longitude may be referred to the true equinox by applying nutation. The variations are given for the instant of Greenwich mean noon. The column *Reduction to Orbit* contains the correction to be applied to the heliocentric longitude in order to obtain the longitude measured along the orbit of the planet. This orbit longitude is equal to the distance from the mean equinox to the node, plus the distance from the node to the planet. The heliocentric latitude is referred to the ecliptic of the date. The *Logarithm of Radius Vector* is the logarithm of the distance of the center of the planet from that of the Sun.

PART II.—THE EPHEMERIS FOR THE MERIDIAN OF WASHINGTON.

Pages 200–201 contain formulæ for reducing mean positions of stars to apparent positions, including expressions for the Besselian star-numbers and star-constants, and for the independent star-numbers; the whole based upon the constants of the Paris Conference of May, 1896, and expressed in the notation of BESSEL.

Pages 202–205 contain the logarithms of the *Besselian Star-Numbers, A, B, C, D,* for each Washington mean midnight, with the values of *E* appended at the bottoms of the pages. The terms of short period have been included. These numbers serve to reduce the mean place of a star at the beginning of the Besselian fictitious year to its apparent place at any of the dates for which the numbers are given, and in ordinary cases four-figure logarithms suffice; but where extreme accuracy is desired the logarithms of *A, C,* and *D* are sometimes needed to five places of decimals. Along with the solar day, the first column contains the sidereal hour of Washington mean midnight for certain dates, and by interpolation among them it is easy to find the sidereal time for which any set of quantities is given.

The following is an example of the reduction of a star to apparent place by the Besselian star-numbers:

Computation of the apparent place of 2 Aquilæ, July 2, 1916, for the upper transit at Washington.

$\log a$	0.5165	$\log b$	7.2441 *n*	$\log c$	8.0434	$\log d$	8.8236 *n*
$\log A$	9.9072	$\log B$	0.6185 *n*	$\log C$	0.5513	$\log D$	1.3032 *n*
$\log a'$	0.5159	$\log b'$	9.9941	$\log c'$	9.4341	$\log d'$	8.4146 *n*
$\log Aa$	0.4237	$\log Bb$	7.8626	$\log Cc$	8.5947	$\log Dd$	0.1268
$\log Aa'$	0.4231	$\log Bb'$	0.6126 *n*	$\log Cc'$	9.9854	$\log Dd'$	9.7178

		h	m	s		°	′	″
Mean Place, 1916.0	$\alpha_0 =$	18	37	40.531	$\delta_0 =$	−9	8	1.93
	$Aa =$			+2.653	$Aa' =$			+2.65
	$Bb =$			+0.007	$Bb' =$			−4.10
	$Cc =$			+0.039	$Cc' =$			+0.97
	$Dd =$			+1.339	$Dd' =$			+0.52
	$E =$			+0.003	$\tau\mu' =$			0.00
	$\tau\mu =$			+0.001				
Apparent Place, July 2,	$\alpha =$	18	37	44.573	$\delta =$	−9	8	1.89

Pages 206–213 contain the *Independent Star-Numbers,* which can frequently be advantageously used instead of the *Besselian Star-Numbers.* The terms of short period have been included. These quantities are connected with those of Bessel by the relations given on page 200, which also contains the formulæ and precepts for the application of both systems of numbers. In order to use

the Besselian numbers, it is necessary to have the values of the star-constants, *a*, *b*, *c*, *d*, *a′*, *b′*, *c′*, *d′*, while the independent star-numbers render it possible to determine the apparent place of a star without computing these star-constants. Four-figure logarithms usually suffice, but where extreme accuracy is desired the logarithms of g and h are needed to five places of decimals, and G and H are needed to one-tenth of a minute of arc. The column τ gives the fraction of a year, counted from the beginning of the Besselian fictitious year to each date.

The following is an example of the reduction of a star to apparent place by the independent star-numbers:

Computation of the apparent place of 2 Aquilæ, July 2, 1916, for the upper transit at Washington.

	h m		° ′
$G =$	23 2.4	$\delta_0 =$	− 9 8.0
$\alpha_0 =$	18 37.7	$G+\alpha_0 =$	17ʰ 40ᵐ.1
$H =$	11 19.8	$H+\alpha_0 =$	5 57.5

					h m s
$\log \frac{1}{15}$	8.8239	$\log \frac{1}{15}$	8.8239	$\alpha_0 =$	18 37 40.531
$\log g$	1.2231	$\log h$	1.3099	$f+f' =$	+2.485
$\sin (G+\alpha_0)$	9.9984 *n*	$\sin (H+\alpha_0)$	0.0000	$(g) =$	+0.178
$\tan \delta_0$	9.2062 *n*	$\sec \delta_0$	0.0055	$(h) =$	+1.378
				$\tau\mu =$	+0.001
$\log (g)$	9.2516	$\log (h)$	0.1393		
				$\alpha =$	18 37 44.573
					° ′ ″
$\log g$	1.2231	$\log h$	1.3099	$\delta_0 =$	− 9 8 1.93
$\cos (G+\alpha_0)$	8.9381 *n*	$\cos (H+\alpha_0)$	8.0377	$(g') =$	−1.45
		$\sin \delta_0$	9.2007 *n*	$(h') =$	−0.04
$\log (g')$	0.1612 *n*			$(i) =$	+1.52
		$\log (h')$	8.5483 *n*	$\tau\mu' =$	0.00
				$\delta =$	− 9 8 1.90
$\log i$	0.1885				
$\cos \delta_0$	9.9945				
$\log (i)$	0.1830				

Page 214 contains for every tenth sidereal day the *Besselian* and *Independent Star-Numbers*, exclusive of all short-period terms. They are useful in computing ephemerides of stars, similar to those on pages 316–513, for which data containing short-period terms should not be employed.

Pages 215–216 contain for Washington mean midnight of each day the short-period terms of the nutation in longitude and obliquity, for use in connection with the formulæ on page 201, and the coefficients mentioned later, which are given for each star on pages 316–513.

Pages 217–230 contain the *Mean Places of Ten-day Stars* for the beginning of the Besselian fictitious year. These pages give also the magnitude, spectral type, annual variations, and proper motions for each star. The annual variations are to be considered as the differential coefficients of each coordinate with respect to the time at the beginning of the year.

Page 231 contains, for the *Circumpolar Stars,* the same data as the immediately preceding pages do for the ten-day stars.

Pages 232–315 contain for every upper transit at Washington the apparent positions of seventeen northern and eighteen southern circumpolar stars arranged in the order of their right ascensions. The mean solar time of transit is given in the column *Washington Mean Time,* in order that each transit above and below the pole may be readily identified. Suppose, for example, that the transit of Polaris below the pole on January 26 is to be found, and we wish to know whether it precedes or follows the upper transit of the same date. On page 232 we find that the upper transit occurs January 26.2; the lower transit, therefore, occurs January 26.7. But the lower transit of July 1 precedes the upper one, which occurs July 1.8. A transit occurring very nearly at noon may also be identified without a computation to ascertain the actual mean date, by simply noting the tenth of a day in the column *Washington Mean Time.*

The secant and tangent of the apparent declination for the 15th of each month and the mean place in right ascension and declination for the beginning of the year are given for each star at the foot of the page.

Pages 316–513 contain, for every tenth upper transit at Washington, the apparent places of 790 stars, being all those given in the list of mean places of ten-day stars. The *Washington Mean Time* in the left-hand column of each page gives the day and tenth of the transit, so that intermediate transits may be readily identified; and to facilitate interpolation, the differences of each coordinate are given for every ten days.

In connection with the ephemeris of each ten-day star there are given at the foot of the page (1) the seconds of the mean place in both right ascension and declination for the beginning of the year, (2) the secant and the tangent of the mean of the star's greatest and least apparent declinations during the year, and (3) the coefficients of the short-period terms of the nutation, the use of which is explained on page 201.

Pages 514–521 contain, for Washington apparent noon, the *Apparent Right Ascension* and *Declination* of the Sun, the *Equation of Time*, and the *Variation per Hour* of these quantities; the *Semidiameter* of the Sun, and the *Sidereal Time* of *Semidiameter Passing Meridian.* The last column on each page contains the *Sidereal Time* of *Mean Noon.*

The Equation of Time, Mean—App. is the correction to be applied to apparent time in order to obtain mean time. Each number as given is the mean time of transit of the Sun's center over the meridian of Washington counted from the nearest noon.

Pages 522–537 contain the *Right Ascension of Center*, the *Geocentric Declination of Center*, the *Sidereal Time of Semidiameter Passing Meridian*, the *Geocentric Semidiameter*, and the *Equatorial Horizontal Parallax* of the Moon, and the *Washington Mean Time* at the moment of each upper and lower transit over the meridian of Washington.

The *Variation per Hour of Longitude* is the correction to be applied in each case to the quantity in the preceding column to obtain its value for the time of transit over the meridian one hour west of Washington, supposing the rate of change to be uniform and equal to what it is at the instant of transit over the meridian of Washington. The quantities in the third column, when corrected for another longitude by the hourly variations, give the local mean time of transit for that longitude. By means of the variations per hour of longitude any one of the quantities under consideration can be computed with great exactness for the moment of transit over any meridian not more than one hour distant from Washington. To obtain the same accuracy for more distant meridians, we may proceed as follows: Let F represent either the *Washington Mean Time*, the *Right Ascension of Center*, or the *Geocentric Declination of Center*, and let V represent the corresponding *Variation per Hour of Longitude.* Write down three successive values of F, together with the corresponding values of V, and difference the latter as in the following scheme, where the middle values, F_0 and V_0, belong to the culmination from which is to be derived the value of F for the culmination on the meridian whose longitude is λ:—

Function.	Var. per Hour of Longitude.	Δ′	Δ″
F_{-1}	V_{-1}		
		a'	
F_0	V_0		b
		a''	
F_{+1}	V_{+1}		

Then, for the culmination at the meridian λ

$$F_\lambda = F_0 + \lambda V_0 + \frac{\lambda^2}{48}(a' + a'') + \frac{\lambda^3 b}{864}$$

where λ must be expressed in hours and decimals of an hour, and reckoned from Washington or from 180° from Washington according as the upper or lower culmination is used for the middle value (F_0). Adding twelve hours to the Washington time of lower transit at Washington gives the local time of upper transit at places whose longitude is 180° from Washington.

The column *Bright Limbs* is given to indicate to the observer which limbs are illuminated. When one limb is full and the terminator is within 1″ of the opposite limb, both can be well observed, and in such cases both are indicated, the defective limb being indicated by an italic letter or numeral, and the correction for defective illumination (as seen from Washington) being given in a footnote.

Pages 538–555 contain for each of the seven major planets, the geocentric *Apparent Right Ascension* and *Declination*, the *Horizontal Parallax, Semidiameter, Sidereal Time of Semidiameter Passing Meridian*, and the *Washington Mean Time*, for the moments of all transits which it is usually desirable to observe over the meridian of Washington. The stellar magnitude at opposition for Mars, Jupiter, Saturn, Uranus, and Neptune, respectively, is given at the bottom of the page containing the ephemeris of the planet.

PART III.—PHENOMENA.

This part gives the dates of the principal astronomical phenomena of the year, expressed in Greenwich mean time, except in the case of the occultations visible at Washington, where Washington time is used.

Pages 558–565 contain all necessary data respecting the solar and lunar eclipses which occur during the year.

The eclipse elements are given for the moment of conjunction of the Sun and Moon in right ascension, but the subsequent tables and results are computed from the exact positions of these bodies at the several instants referred to. The times and angles designated as the circumstances of a lunar eclipse remain the same throughout all parts of the Earth, and require no explanation beyond a mere statement of the fact that in computing them the geometrical diameter of the Earth's shadow has been augmented in the proportion of 51 : 50. The principal circumstances of each total and annular eclipse of the Sun are stated in five lines, as follows:—

The line entitled "Eclipse begins" gives the Greenwich mean time at which the Moon's penumbra first touches the Earth, together with the latitude and longitude of the point of contact.

The line entitled "Central eclipse begins" gives the time when the axis of the Moon's shadow first touches the Earth, and the latitude and longitude of the point of contact follow.

The line entitled "Central eclipse at local apparent noon" gives the time when the axes of the Earth and of the shadow cone lie in the same plane. The latitude and longitude of the point where the axis of the shadow cone then cuts the Earth's surface follow, and there the eclipse will be central and the Sun will be exactly on the meridian.

The lines entitled "Central eclipse ends" and "Eclipse ends" give, respectively, the times when and the localities where these events occur, the phenomena being the converse of those denoted by the similar phrases for the beginning.

In the case of partial solar eclipses the axis of the Moon's shadow does not come into contact with the Earth, and the three lines entitled, respectively, "Central eclipse begins," "Central eclipse at local apparent noon," and "Central eclipse ends," are replaced by a single line entitled "Greatest eclipse," whereon are given the time when and the latitude and longitude where the eclipse attains its greatest magnitude. The latter phenomenon necessarily occurs with the Sun in the horizon.

Maps of the Eclipses.—The regions in which each eclipse is visible are shown upon the map relating to it, from which may be taken approximately, for any place, both the times of the beginning and ending of the eclipse and its magnitude. The dotted curves show the outline of the shadow for each hour of Greenwich mean time, and therefore pass through all places where the eclipse begins or ends at the hour indicated. To find the instant of beginning at any place, we determine by inspection between what pair of these curved lines the place is situated. The eclipse will then begin between the corresponding hours of Greenwich mean time; and the fraction of the hour may be determined by dividing the hour in the same proportion as the space representing it on the map is divided by the place in question. This division may be made a little more exact by allowing for the changes in the spaces as indicated by their varying width. The Greenwich mean time thus found must be reduced to local mean time by applying the longitude.

As an example, suppose we wish to find the times at which the eclipse of 1916, February 3, begins and ends at a point near Washington, latitude +38° 54′, longitude +77° 3′.

For the beginning we compare the distance of the place from the curves of 3^h and 4^h, and find it to correspond to about 10 minutes from the former, thus giving for the approximate time of beginning 3^h 10^m; for the end we compare the distance of the place from the curves of 5^h and 6^h, and find it to be about 20 minutes from the former, thus giving for the approximate time of *ending* 5^h 20^m, and both of these results are probably correct to within 3 or 4 *minutes.*

Changing to local mean time, we shall have—

		Beginning. d h m	*Ending.* d h m
Greenwich mean time	February	3 3 10	3 5 20
Longitude west		5 8	5 8
Local mean time	February	2 22 2	3 0 12

In the case of total and annular eclipses, a fair estimate of the magnitude of the eclipse at any place may be obtained from the position thereof relatively to the central line and to the limit. On the central line the eclipse is annular or total, while between the central line and the limit the maximum magnitude of the eclipse is given by the quotient of the distance of the place from the limit divided by the distance of the central line from the limit; the measurements being made upon a line drawn through the place perpendicularly to the central line.

More Accurate Computations.—A more accurate determination of the phases, as visible at any point of the Earth's surface, may be obtained from the Besselian elements which are given for every 10 minutes of Greenwich mean time. Their geometric signification is as follows:—

Let us imagine a plane passing through the center of the Earth, perpendicular to the right line joining the centers of the Sun and Moon. This latter line is the axis of the Moon's shadow, and the plane is called the *fundamental plane* or plane of xy. We take the intersection of this plane with that of the Earth's equator as the axis of x, and the center of the Earth as the origin of coordinates. The axis of y is perpendicular to that of x, and directed toward the north; x and y are then the coordinates of the point in which the axis of the shadow intersects the fundamental plane, and they are here expressed in terms of the Earth's equatorial radius as unity. The angle d, of which the sine and cosine are both given, is the declination of that point of the celestial sphere toward which the axis of the shadow is directed; or, in other words, it is the declination of the center of the Sun as seen from the center of the Moon. The angle μ is the Greenwich hour-angle of this same point of the celestial sphere.

The quantities l_1 and l_2 are the radii of the shadow cones upon the fundamental plane, l_1 corresponding to the penumbra, and l_2 to the umbra, or annulus. The notation is that of CHAUVENET'S *Spherical and Practical Astronomy*, in which l_2 is regarded as positive for an annular and negative for a total eclipse.

The angles f_1 and f_2, the tangents of which are given, are the angles which the elements of the respective shadow cones make with the axis of the shadow; or, they are the semiangles of the two cones.

In order to facilitate interpolation to any required moment, the logarithms of x', y', and μ', which are the changes of x, y, and μ, in one minute of time, are given at the bottom of the table.

The method of computing an eclipse from its Besselian elements is based on the fact that at the moments of beginning and ending the distance of the observer from the axis of the shadow or penumbra is equal to the radius of the latter at the point of observation. To find this distance and radius we proceed as follows:

(1) The coordinates of the observer, ξ, η, and ζ, together with their variations in one minute, are computed for some assumed moment of Greenwich mean time, as near as practicable to the true time of the required phase.

(2) The coordinates x and y of the axis of the shadow, together with their variations in one minute, are taken for the same moment from the tables of elements.

(3) From (1) and (2) the position and motion of the observer relative to the axis of the shadow are found.

(4) The radius of the penumbra or umbra at a distance from the fundamental plane equal to that of the observer is also computed.

(5) Then, assuming the motions to be uniform, we determine the time required for the observer to be brought to a distance from the axis of the shadow equal to this radius.

The formulæ and directions for the several steps in the computation are as follows:—

(1) Find $\rho \cos \varphi'$ and $\rho \sin \varphi'$, which are the geocentric coordinates of the station referred to the Earth's equator, ρ being the distance from the center of the Earth and φ' the geocentric latitude. These coordinates may be computed from the following table based on the compression of the Earth adopted at the Paris Conference of 1911, 1/297, by the formulæ—

$$\rho \cos \varphi' = F \cos \varphi$$
$$\rho \sin \varphi' = \frac{\sin \varphi}{G}$$

φ being, as usual, the geographic latitude.

Table for Computing the Geocentric Coordinates of a Place.

φ	Log F.		Log G.	
0°	0.00000	1	0.00293	1
5	0.00001	3	0.00292	3
10	0.00004	6	0.00289	6
15	0.00010	7	0.00283	7
20	0.00017	9	0.00276	9
25	0.00026	11	0.00267	11
30	0.00037	11	0.00256	11
35	0.00048	12	0.00245	13
40	0.00060	13	0.00232	12
45	0.00073	13	0.00220	13
50	0.00086	12	0.00207	12
55	0.00098	12	0.00195	12
60	0.00110	10	0.00183	10
65	0.00120	9	0.00173	9
70	0.00129	8	0.00164	8
75	0.00137	5	0.00156	5
80	0.00142	3	0.00151	3
85	0.00145	1	0.00148	2
90	0.00146		0.00146	

For the assumed Greenwich mean time of computation, take from the table of elements the values of $\sin d$, $\cos d$, and μ. Then, with λ for the longitude west from Greenwich, the coordinates of the observer will be—

$$\xi = \rho \cos \varphi' \sin (\mu - \lambda)$$
$$\eta = \rho \sin \varphi' \cos d - \rho \cos \varphi' \sin d \cos (\mu - \lambda) = \eta_1 - \eta_2$$
$$\zeta = \rho \sin \varphi' \sin d + \rho \cos \varphi' \cos d \cos (\mu - \lambda) = \zeta_1 + \zeta_2$$

and their variations in one minute of mean time will be—

$$\xi' = [7.63992]\ \rho \cos \varphi' \cos (\mu - \lambda)$$
$$\eta' = [7.63992]\ \rho \cos \varphi' \sin d \sin (\mu - \lambda) = [7.63992]\ \xi \sin d$$

ζ' is not needed.

(2) For the same assumed moment of Greenwich mean time, take from the tables of elements the coordinates x and y of the axis of the shadow, together with their variations for one minute, which are equal to one-tenth of the differences of two consecutive numbers. These variations are represented by x' and y', and their logarithms are given beneath the tables of x and y.

(3) The distance m and position-angle M of the axis of the shadow relatively to the observer, and the relative motions, n and N, are computed by the formulæ—

$$\begin{aligned} m \sin M &= x - \xi \\ m \cos M &= y - \eta \\ n \sin N &= x' - \xi' \\ n \cos N &= y' - \eta' \end{aligned}$$

(4) Both for the shadow and for the penumbra, the radius L at the distance ζ from the fundamental plane is computed by the formula—

$$L = l - \zeta \tan f$$

l and f being found from the table of elements, and ζ computed in (1).

(5) If the time chosen for computation is exactly that of the beginning or ending of the eclipse, we shall have—

$$m = L$$

But, as this condition will rarely be fulfilled on a first trial, a correction τ to the assumed time is computed thus: Find the angle ψ from the equation,

$$\sin \psi = \frac{m \sin (M - N)}{L}$$

There will be two values for this angle, of which one will be in the first and the other in the second quadrant when $\sin \psi$ is positive, and one in the third and the other in the fourth quadrant when $\sin \psi$ is negative; but simplicity will be gained by taking only that value of ψ for which $\cos \psi$ is positive. This value lies between the limits +90° and −90°. The correction τ to the assumed time of beginning or ending of the eclipse will then be found, in minutes, from—

$$\tau = -\frac{m \cos (M - N)}{n} \mp \frac{L \cos \psi}{n}$$

where the double sign is to be taken negative for the beginning and positive for the ending.

However, one such pair of values of τ can not give the times of both beginning and ending with accuracy. To attain that, we must commence the computation by assuming two times, one near the beginning and the other near the ending of the eclipse, both of which may be derived from the chart with sufficient exactness. The computation for the first assumed time will give a small value of τ which, when applied to the assumed time, will give the beginning of the eclipse nearly correctly, and a large value which will give an inaccurate time of ending. Similarly, the computation for the second assumed time will give a small and nearly correct value of τ for finding the time of ending, and a large and inaccurate negative value for finding the time of beginning. We shall thus deduce two times of each phase, only one of which is to be regarded as approximately correct.

The more accurate times of beginning and ending may now be taken in place of those originally assumed, and the whole computation may be repeated, thus leading to a pair of values of τ, which should be very small and accurate. Such a repetition of the computation will in general be advisable, to guard against accidental numerical errors, but a second approximation may be obtained without it, by finding a corrected value of τ in accordance with the formulæ—

$$\delta\tau = \mp \frac{\tau(l' + [5.3100]\xi \cos d)}{n \cos \psi} - \frac{[4.9788]\tau^2}{n \cos \psi}[\xi \sin (N \mp \psi) - \eta_2 \cos (N \mp \psi)]$$

$$\tau_0 = \tau + \delta\tau$$

where the double signs are to be taken negative for the beginning of the eclipse and positive for the ending. l' is the variation of l for one minute of time, and its numerical value can be taken by inspection from the table of Besselian elements.

If the resulting values of τ_0 are not greater than fifteen minutes, the corrected times of contact thus obtained will be theoretically exact within less than a second, but the uncertainties of the solar and lunar tables are such that an unavoidable error of several seconds may exist in the prediction. To guard against numerical mistakes it is better, after making this final correction, to repeat the computations so far as to obtain new values of m and L for the corrected times. If these two quantities agree within a unit of the fourth place of decimals, the times employed are generally correct within a second of time. If they differ too widely, the computer must use his own judgment as to making further corrections and computations.

Position-angle of Point of Contact.—The position-angle P, of the point of contact, reckoned from the north point of the Sun's limb toward the east, is found by the formulæ—

$$\begin{array}{lll} & P = N - \psi \pm 180^\circ & \text{for the beginning,} \\ \text{or} & P = N + \psi & \text{for the ending,} \end{array}$$

it being assumed that, in each case, the value of ψ is taken between the limits $\pm 90^\circ$.

Computation of the Solar Eclipse of 1916, February 3, for Washington.

The position of the point chosen is—

$$\begin{array}{lrrr} & ^\circ & ' & '' \\ \text{Latitude, } \varphi = & +38 & 54 & 0 \\ \text{Longitude, } \lambda = & +77 & 3 & 0 \end{array}$$

Its geocentric coordinates are—

$$\rho \sin \varphi' = 9.79558$$
$$\rho \cos \varphi' = 9.89169$$

From the Eclipse Chart we find the approximate times of the phases to —

	d	h	m	
Beginning February	3	3	10	Greenwich Mean Time.
Ending	3	5	20	

	Beginning.	Ending.
Greenwich Mean Time, T, February 3,	$3^h\ 10^m$	$5^h\ 20^m$
μ	44° 1′ 42″	76° 31′ 42″
λ	+77 3 0	+77 3 0
$\mu-\lambda$	−33 1 18	− 0 31 18
$\rho \cos \varphi'$	9.89169	9.89169
$\sin (\mu-\lambda)$	9.73636 n	7.95926 n
$\log \xi$	9.62805 n	7.85095 n
ξ	−0.42467	−0.00710
$\rho \sin \varphi'$	9.79558	9.79558
$\cos d$	9.98109	9.98114
$\log \eta_1$	9.77667	9.77672
η_1	+0.59796	+0.59803
$\rho \cos \varphi'$	9.89169	9.89169
$\sin d$	9.46062 n	9.45999 n
$\cos (\mu-\lambda)$	9.92349	9.99998
$\log \eta_2$	9.27580 n	9.35166 n
η_2	−0.18871	−0.22473
$\eta=\eta_1-\eta_2$	+0.78667	+0.82276
$\rho \sin \varphi' \sin d$	9.25620 n	9.25557 n
ζ_1	−0.18038	−0.18012
$\rho \cos \varphi' \cos d \cos (\mu-\lambda)$	9.79627	9.87281
ζ_2	+0.62556	+0.74612
$\zeta=\zeta_1+\zeta_2$	+0.44518	+0.56600
const. log	7.63992	7.63992
$\rho \cos \varphi' \cos (\mu-\lambda)$	9.81518	9.89167
$\log \xi'$	7.45510	7.53159
ξ'	+0.002852	+0.003401
const. log	7.63992	7.63992
$\xi \sin d$	9.08867	7.31094
$\log \eta'$	6.72859	4.95086
η'	+0.000535	+0.000009
$x-\xi$	−0.20669	+0.52109
$y-\eta$	−0.50656	−0.07282
$x'-\xi'$	+0.005961	+0.005407
$y'-\eta'$	+0.003076	+0.003608
$m \sin M$	9.31532 n	9.71691
$m \cos M$	9.70463 n	3.86225 n
$\tan M$	9.61069	0.85466 n

	Beginning.	Ending.
M	202° 11′ 48″	97° 57′ 19″
$\sin M$	9.57725 n	9.99580
$\log m$	9.73807	9.72111
$n \sin N$	7.77532	7.73296
$n \cos N$	7.48799	7.55727
$\tan N$	0.28733	0.17569
N	62° 42′ 19″	56° 17′ 9″
$\sin N$	9.94873	9.92003
$\log n$	7.82659	7.81293
$\tan f$	7.67608	7.67607
$\log \zeta$	9.64854	9.75282
	7.32462	7.42889
$\zeta \tan f$	+0.00211	+0.00268
l	+0.54248	+0.54265
L	+0.54037	+0.53997
$M-N$	139° 29′ 29″	41° 40′ 10″
$\sin (M-N)$	9.81262	9.82271
$\log m$	9.73807	9.72111
$\operatorname{colog} L$	0.26731	0.26763
$\sin \psi$	9.81800	9.81145
ψ	+41° 7′ 17″	+40° 22′ 36″
$\log \frac{m}{n}$	1.91148	1.90818
$\cos (M-N)$	9.88099 n	9.87332
	1.79247 n	1.78150
$-\frac{m}{n} \cos (M-N)$	+62.011	−60.464
$\log L$	9.73269	9.73237
$\cos \psi$	9.87698	9.88184
$\operatorname{colog} n$	2.17341	2.18707
	1.78308	1.80128
$\mp \frac{L \cos \psi}{n}$	−60.684	+63.281
	m	m
τ	+ 1.327	+ 2.817
	d h m	d h m
$T+\tau$	3 3 11.327	3 5 22.817

Although neither value of τ is large, we compute the correction $\delta\tau$ for the ending as follows:

	Ending.
const. log	5.3100
$\log \xi$	7.8510 n
$\cos d$	9.9811
	3.1421 n

	Ending.
number	−0.0000001
l'	+0.0000008
sum	+0.0000007

	Ending.
log (sum)	3.8451
$\log \tau$	0.4498
colog n	2.1871
$\sec \psi$	0.1182
	6.6002
(1)	+0.0004
$N+\psi$	96° 40′
$\sin (N+\psi)$	9.9971
$\log \xi$	7.8510 n
$\log \xi \sin (N+\psi)$	7.8481 n
$\cos (N+\psi)$	9.0648 n
$\log \eta_2$	9.3517 n
$\log \eta_2 \cos (N+\psi)$	8.4165

	Ending.
$\xi \sin (N+\psi)$	−0.0070
$\eta_2 \cos (N+\psi)$	+0.0261
diff.	−0.0331
log (diff.)	8.5198 n
const. log	4.9788 n
$\log \tau^2$	0.8996
colog ($n \cos \psi$)	2.3052
	6.7034
(2)	+0.0005
$(1)+(2)=\delta\tau$	m +0.001
τ	+2.817
τ_0	+2.818

The corrected time of ending is, therefore,

$$T_0 = \text{February}\quad 3^d\ 5^h\ 22^m.818$$

Whence we find—

		Beginning.			Ending.		
		d	h	m	d	h	m
Greenwich Mean Time, February		3	3	11.327	3	5	22.818
λ	+		5	8.200	+	5	8.200
Local Mean Time,	February	2	22	3.127	3	0	14.618

Therefore we have—

		d	h	m	s	
Beginning of the Eclipse,	February	2	22	3	7.6	Local Mean Time.
End of the Eclipse,	February	3	0	14	37.1	

	Beginning.		Ending.	
	°	′	°	′
$N \mp \psi$	21	35.0	96	39.8
constant	180	0.0	0	0.0
Angle of position, P	201	35.0	96	39.8

from the north point of the Sun's disk toward the east for direct image.

Pages 566–570 contain the adopted mean places and annual proper motions of such stars, as bright as magnitude 6.5, as will be occulted during the year by the Moon.

Pages 571–607 contain the elements for the prediction of the times of occultations of stars and planets by the Moon during the current year. The system of coordinates employed is similar to that already described for eclipses, the fundamental plane passing through the center of the Earth, and being taken perpendicular to the line joining the star and the center of the Moon, but the cone circumscribing the Moon and star is regarded as a cylinder which intercepts the fundamental plane in a circle having the same linear diameter as the Moon.

In the columns referring to the star, those headed *Red'ns from 1916.0* give the quantities necessary to reduce the mean place of the star at the beginning of 1916 to its apparent place at the time of occultation. These reductions are sufficiently accurate to be definitive.

Under the general head, *At Conjunction in R. A.*, are five columns giving certain quantities for the moment of geocentric conjunction of the Moon and star in right ascension, as follows:

The *Greenwich Mean Time* is the moment, T, at which the two bodies are in geocentric conjunction in right ascension. At that moment the coordinate x of the axis of the cylinder on the fundamental plane has the value zero. The column *Hour Angle*, H, gives the common geocentric hour-angle of the Moon and star at the same moment, expressed in sidereal time and counted from the meridian of Greenwich—positive toward the west and negative toward the east. Column Y gives the coordinate y of the axis of the cylinder upon the fundamental plane at the same moment. Columns x' and y' give the variations of x and y in one hour of mean time. The linear unit in these columns is the Earth's equatorial radius. The limiting parallels, north and south, show the extreme limits of latitude within which the occultation will be visible.

By the aid of these elements, the time of immersion and emersion of a star relatively to the limb of the Moon may be computed for any part of the Earth by a method nearly the same as that already explained for computing eclipses, but somewhat more simple.

Prediction of Occultations for a given Place.—When it is desired to predict the circumstances of one or more occultations at any place, the first step will be to select them from the general list given in the Ephemeris. The conditions of visibility are:—

1. The limiting parallels in the last columns must include the latitude of the place.
2. The quantity $H-\lambda$, taken without regard to sign, must be less than the semidiurnal arc of the star by at least one hour. On very rare occasions an emersion might be seen in the east, or an immersion in the west, when this difference is a few minutes less than an hour.
3. The Sun must not be much more than an hour above the horizon at the local mean time $T-\lambda$, unless the star is bright enough to be seen in the daytime.

When many occultations are to be selected, the most convenient course will be to write the value of $-\lambda$ on the bottom of a slip of paper, and in passing through the list of occultations to pause over each one for which condition (1) is fulfilled, and examine by means of the slip whether conditions (2) and (3) are also fulfilled. If either fails, the computer passes on. Sometimes it will be difficult to determine whether $H-\lambda$ or $T-\lambda$ falls within the limits; and in such cases the computer may mark the occultation for trial and leave the decision for the subsequent operations. The whole list can be gone over in less than a day, and it will probably be found that about one-tenth of the occultations are marked for trial.

The next step will be to compute the local times of immersion and emersion from the elements, and to that end let—

$T=$ the instant of geocentric conjunction of Moon and star in right ascension, expressed in Greenwich mean time;
$H=$ the Greenwich west hour-angle of the two bodies at that moment;
$\lambda=$ the longitude west of Greenwich;
$h_0=H-\lambda=$ the local hour-angle of the star at the instant T;
$\delta=$ the star's declination.

The procedure for each occultation will then be as follows:—

(1) The geocentric coordinates of the place, $\rho \sin \varphi'$ and $\rho \cos \varphi'$, are to be computed by the formulæ and table given in connection with eclipses on page 722.

The next step will be to find the approximate instant of apparent conjunction of the Moon and star as seen from the place, and that may be deduced from the time of geocentric conjunction by the application of an approximate correction taken from DOWNES's table, printed in the volumes of the American Ephemeris for 1882 to 1899. This correction must be reckoned in mean solar hours, and will be designated by the symbol t. It will have the same sign as h_0.

When DOWNES's table is not available, the correction may be computed from the formulæ,

$$\xi_0 = \rho \cos \varphi' \sin h_0$$

$$\xi' = [9.4192]\, \rho \cos \varphi' \cos \frac{4}{3} h_0$$

$$t = \frac{\xi_0}{x' - \xi'}$$

By applying t to the Greenwich mean time of geocentric conjunction, as given with the elements, we shall have the Greenwich mean time of local conjunction within a few minutes.

(2) Compute for the instant $T+t$ the following quantities, in which t_0 is the sidereal equivalent of the mean time interval t:

$$\begin{aligned}
\xi &= \rho \cos \varphi' \sin (h_0 + t_0) \\
\eta &= \rho \sin \varphi' \cos \delta - \rho \cos \varphi' \sin \delta \cos (h_0 + t_0) = \eta_1 - \eta_2 \\
\xi' &= [9.4192]\, \rho \cos \varphi' \cos (h_0 + t_0) \\
\eta' &= [9.4192]\, \rho \cos \varphi' \sin \delta \sin (h_0 + t_0) = [9.4192]\, \xi \sin \delta \\
x &= x't \\
y &= Y + y't
\end{aligned}$$

Compute also m, M, n, N, and ψ from the equations,

$$\begin{aligned}
m \sin M &= x - \xi \\
m \cos M &= y - \eta \\
n \sin N &= x' - \xi' \\
n \cos N &= y' - \eta' \\
\sin \psi &= [0.5646]\, m \sin (M - N)
\end{aligned}$$

ψ being taken between the limits ±90°. Finally compute,

$$\tau = -\frac{[1.7782]m}{n} \cos (M - N) \mp \frac{[1.2135]}{n} \cos \psi$$

$$\delta\tau = \frac{[6.7591]\tau^2}{n \cos \psi} [\eta_2 \cos (N \mp \psi) - \xi \sin (N \mp \psi)]$$

where the double signs are to be taken negative for an immersion and positive for an emersion. Both τ and $\delta\tau$ thus have two values, which are expressed in minutes of time, and in order to distinguish them let those pertaining to immersion be designated respectively τ' and $\delta\tau'$, while those pertaining to emersion are designated τ'' and $\delta\tau''$. We then have for the Greenwich mean times of the phases,

$$\begin{aligned}\text{Instant of immersion} &= T+t+\tau'+\delta\tau' \\ \text{Instant of emersion} &= T+t+\tau''+\delta\tau''\end{aligned}$$

These expressions are practically exact, as the corrections $\delta\tau$ seldom amount to so much as 1.5 minutes, and whenever an inaccuracy of that magnitude is permissible they may be omitted. As a check upon the results it will be advisable to compute ξ, η, x, and y for the times of immersion and emersion finally obtained. If these times are correct, the quantities in question will fulfill the condition,

$$\sqrt{(x-\xi)^2+(y-\eta)^2}=0.2725$$

If $\log m \sin (M-N)>9.4354$, $\sin \psi$ will be numerically greater than unity, and no occultation is to be expected at the given place; but a very brief one may occur if the excess of the computed distance over the Moon's semidiameter happens to be within the errors of the ephemerides of the Moon and star.

The position-angle of the line from the Moon's center to the star, at the time of contact, is reckoned from the north point toward the east, and designated by the symbol P. It is computed from the formulæ,

$$\begin{aligned} &P=N-\psi+\delta P \qquad\qquad \text{for immersion,} \\ \text{or}\quad &P=N+\psi+\delta P\pm 180^\circ \text{ for emersion,}\end{aligned}$$

where the angles $N-\psi$ and $N+\psi$ are taken directly from the computation of $\delta\tau$, and δP is found in degrees of arc from the expression,

$$\delta P=\mp\frac{[7.3038]\tau^2}{\cos\psi}[\eta_2 \sin N+\xi \cos N]$$

In the latter formula the double sign is to be taken negative for an immersion and positive for an emersion.

The angle from the vertex, V, is also reckoned in the direction from the north toward the east, and is found from the formula,

$$V=P-C$$

where C is computed from the expression,

$$\tan C=\frac{\xi+[8.2218]\tau\xi'-[4.9810]\tau^2\xi}{\eta+[8.2218]\tau\eta'+[4.9810]\tau^2\eta_2}$$

C being taken less or greater than 180°, according as the numerator is positive or negative.

The value of τ employed in the latter formula must be so taken as to correspond with the phase for which C is required.

In the volumes of the American Ephemeris for the years 1882 to 1901 instructions are given for constructing three special tables which greatly diminish the labor of computing occultations, but as these tables should contain from 4700 to 6300 quantities, and as they would apply only to the place for which they were computed, it will rarely be worth while to undertake the labor of forming them. Those who desire further information on the subject may consult any one of the volumes in question.

As an example of an isolated occultation, we will compute that of 112 B. Aurigæ on March 11, 1916, for Miami, Fla., whose position is—

$$\varphi = +25^\circ\ 46'\ 28''.0$$
$$\lambda = +\ 5^h\ 20^m\ 45^s.8$$

and whose geocentric coordinates are—

$$\rho \sin \varphi' = 9.6357$$
$$\rho \cos \varphi' = 9.9548$$

From the elements on page 578 we have,

$$T = \overset{h}{12}\ \overset{m}{20.6}$$
$$H = +\ 6\ \ 6.0$$

and $$h_0 = H - \lambda = +\ 0\ \ 45.2$$

From the formulæ on page 729, we find the correction, t, to the Greenwich mean time of geocentric conjunction, T, to be about $+0^h\ 33^m.4$; therefore the Greenwich mean time of apparent conjunction is—

$$T+t = \text{March } 11^d\ 12^h\ 54^m.0$$

112 B. Aurigæ.	Apparent Declination. ° ′ +26 52.5	G. M. T. of ☌ d h m Mar. 11 12 20.6	Hour Angle. h m + 6 6.0	Y −0.0180	x' 0.5456	y' −0.0092

$T+t$	Mar. $11^d\ 12^h\ 54^m.0$
h_0	+ 0 45.2
t_0	+ 0 33.5
h_0+t_0	+ 1 18.7
$\rho \cos \varphi'$	9.9548
$\sin (h_0+t_0)$	9.5272
$\log \xi$	9.4820
ξ	+0.3034
$\rho \sin \varphi'$	9.6357
$\cos \delta$	9.9504
$\log \eta_1$	9.5861
η_1	+0.3856
$\rho \cos \varphi'$	9.9548
$\sin \delta$	9.6552
$\cos (h_0+t_0)$	9.9739
$\log \eta_2$	9.5839
η_2	+0.3836
$\eta_1 - \eta_2 = \eta$	+0.0020
const. log	9.4192
$\rho \cos \varphi' \cos (h_0+t_0)$	9.9287
$\log \xi'$	9.3479
ξ'	+0.2228
const. log	9.4192
$\xi \sin \delta$	9.1372
$\log \eta'$	8.5564

η'	+0.0360
$\log x'$	9.7369
$\log t$	9.7455
$\log x$	9.4824
x	+0.3037
$\log y'$	7.9638 *n*
$\log y't$	7.7093 *n*
$y't$	−0.0051
Y	−0.0180
y	−0.0231
$x-\xi$	+0.0003
$y-\eta$	−0.0251
$x'-\xi'$	+0.3228
$y'-\eta'$	−0.0452
$m \sin M$	6.4771
$m \cos M$	8.3997 *n*
$\tan M$	8.0774 *n*
M	179° 19′
$\cos M$	0.0000 *n*
$\log m$	8.3997
$n \sin N$	9.5089
$n \cos N$	8.6551 *n*
$\tan N$	0.8538 *n*
N	97° 58′
$\sin N$	9.9958
$\log n$	9.5131

const. log	0.5646
log m	8.3997
sin $(M-N)$	9.9950
sin ψ	8.9593
ψ	+ 5° 13′
const. log	1.7782
log $\frac{m}{n}$	8.8866
cos $(M-N)$	9.1772
	9.8420

$-\frac{[1.7782]m}{n}\cos(M-N)$	−0.70
const. log	1.2135
colog n	0.4869
cos ψ	9.9982
	1.6986
$\mp\frac{[1.2135]\cos\psi}{n}$	∓ 49.96
τ for immersion	− 50.66
τ for emersion	+ 49.26

The computation of $\delta\tau$ for the two contacts is as follows:

	Immersion.	Emersion.
$N\mp\psi$	92° 45′	103° 11′
cos $(N\mp\psi)$	8.6810 n	9.3581 n
log η_2	9.5839	9.5839
log (1)	8.2649 n	8.9420 n
(1)	−0.0184	−0.0875
sin $(N\mp\psi)$	9.9995	9.9884
log ξ	9.4820	9.4820
log (2)	9.4815	9.4704
(2)	+0.3031	+0.2954
(1) − (2)	−0.3215	−0.3829
log [(1) − (2)]	9.5072 n	9.5831 n
const. log	6.7591	6.7591
log τ^2	3.4094	3.3850
colog $(n \cos\psi)$	0.4887	0.4887
log $\delta\tau$	0.1644 n	0.2159 n
	m	m
$\delta\tau$	− 1.46	− 1.64
$\tau+\delta\tau$	− 52.12	+ 47.62
	d h m	h m
$T+t$	Mar. 11 12 54.0	12 54.0
Greenwich Mean Time of Phase,	" 11 12 1.9	13 41.6
λ	+5 20.8	+ 5 20.8
Miami Mean Time,	Mar. 11 6 41.1	8 20.8

To find δP and P:

log η_2	9.5839	log ξ	9.4820	(3)	+0.3799
sin N	9.9958	cos N	9.1420 n	(4)	−0.0421
log (3)	9.5797	log (4)	8.6240 n	(3) + (4)	+0.3378

	Immersion.	Emersion.
log [(3) + (4)]	9.5287	9.5287
const. log	7.3038 n	7.3038
log τ^2	3.4094	3.3850
colog cos ψ	0.0018	0.0018
log δP	0.2437 n	0.2193

	Immersion.	Emersion.
	°	°
δP	− 1.8	+ 1.7
$N \mp \psi$	92.8	103.2
constant	0.0	180.0
Angle of position, P	91.0	284.9

from the north point of the Moon's limb toward the east, for direct image.

Pages 607–609 contain in detail all the data necessary for observing every occultation of the general list which is visible at Washington during the current year.

Page 610 contains the *Ephemeris for Physical Observations of the Sun.*

Page 611 contains certain elements referring to the Moon, its equator, and its orbit.

i is the inclination of the Moon's mean equator to the Earth's true equator.

Δ is the distance on the Moon's mean equator from its ascending node on the Earth's true equator to its ascending node on the ecliptic of date.

☊′ is the distance along the Earth's true equator from the true equinox to the ascending node of the Moon's mean equator.

Γ' is the longitude of the perigee of the Moon's orbit, referred to the mean equinox of date.

☊ is the longitude of the ascending node of the Moon's orbit on the ecliptic, referred to the mean equinox of date.

☾ is the Moon's mean longitude, referred to the mean equinox of date.

Pages 612–619 contain the *Ephemeris for Physical Observations of the Moon.* The selenographic longitudes are measured in the plane of the Moon's equator, the axis of reference being the radius of the Moon which passes through the mean center of the visible disk, positive toward the west—i. e., toward Mare Crisium—and the latitudes are measured from the Moon's equator, positive toward the north—i. e., in the hemisphere containing Mare Serenitatis.

The optical and physical librations in longitude and latitude have been computed with elements and formulæ given on page xiii, and their sums are given in the second and third columns, respectively, the physical libration being given separately in the fourth and fifth columns. The Sun's selenographic colongitude (90° − longitude) and latitude and the position-angle of the Moon's axis, C, in the sixth, seventh, and eighth columns, respectively, have all been corrected for the effect of physical libration.

When the libration in longitude is positive, the mean center of the disk is displaced toward the east—that is, the region thus exposed to view is on the west limb—and when the libration in latitude is positive the mean center of the disk is displaced toward the south—that is, the region thus exposed to view is on the north limb.

The altitude of the Sun, A, at any given time above the horizon of any point on the Moon whose selenographic longitude and latitude, λ and β, are known, may be computed from the following formula, the Sun's selenographic longitude and latitude being denoted by $l_{\odot}$ and $b_{\odot}$, respectively:

$$\sin A = \sin b_{\odot} \sin \beta + \cos b_{\odot} \cos \beta \cos (l_{\odot} - \lambda)$$

Pages 620–621 contain the data with reference to the illuminated disks of Mercury and Venus. The angle θ is the angle which the arc of the great circle from the planet to the Sun makes with the arc from the planet toward the west, measured in the direction west, north, east, south. It is measured from 0° to 360°. We may also regard θ as expressing the angle which the line of cusps makes with the meridian, the positive direction of the meridian being toward the north, and the positive direction of the line of cusps that in which a person following this line would have the illuminated portion of the disk on his right.

Pages 622–625 contain the *Ephemeris for Physical Observations of Mars.* The quantities here given have been corrected for aberration, so that in using them they should be interpolated to the actual time of observation.

P is the position-angle of the axis of rotation measured eastward from the north point of the disk.

$A_{\oplus}$ and $A_{\odot}$ are the planetocentric right ascensions of the Earth and Sun, respectively, measured in the plane of the planet's equator from its vernal equinox.

$D_{\oplus}$ and $D_{\odot}$ are the planetocentric declinations of the Earth and Sun, respectively, referred to the planet's equator.

⊙ ♂ is the planetocentric longitude of the Sun measured in the plane of the planet's orbit from its vernal equinox.

k is the ratio of the area of the illuminated portion of the apparent disk to the area of the entire apparent disk regarded as circular.

i is the angle between the Sun and the Earth as seen from the planet.

q is the angular value of the greatest defect of illumination as seen from the Earth.

Q is the position-angle of the radius of the disk which passes through the point of greatest defect of illumination—that is, of the radius perpendicular to the line joining the cusps. It is measured eastward from the north point of the disk.

The column headed *Central Meridian* contains the longitude of the meridian which bisects the disk, measured from the adopted zero meridian.

The columns headed *Mean Time of Transit of Zero Meridian* contain the Greenwich Mean Time of every transit of the zero meridian across the actual center of the disk.

Page 626 contains, for the *Satellites of Mars*, the diagram of their orbits and the times of their elongations.

Pages 627–630 contain the *Ephemeris for Physical Observations of Jupiter.*

The columns headed *Central Meridian* contain the longitudes of the meridian which bisects the disk, measured from the adopted zero meridian of System I and System II, respectively.

The column headed *Correction for Phase* contains the corrections to be applied to the longitudes of the central meridian to obtain the longitudes of the meridian bisecting the illuminated disk.

The column headed *Transit of Zero Meridian* contains the Greenwich Mean Time of every fifth transit of the zero meridian across the center of the illuminated disk.

The quantities in the remaining columns on pages 627–628 are the same as those defined under the *Ephemeris for the Physical Observations of Mars.*

Pages 631–655 contain, concerning the *Satellites of Jupiter*, the diagram of the orbits of Satellites I–V, the times of conjunction of Satellites I–IV, the times of elongation of Satellite V, the differences in right ascension and declination between Jupiter and Satellites VI and VII, and the phenomena of the Satellites I–IV together with their configurations.

Page 656 contains the *Magnitude of Saturn* and the *Elements of the Rings.*

Pages 657–665 contain, concerning the *Satellites of Saturn*, the diagram of the orbits of the seven inner satellites, the times of elongation for the first eight satellites, the differences in right ascension and declination between Saturn and Phœbe, the ninth satellite, and tables for predicting the position-angles and distances from the center of the planet of the first eight satellites.

Page 666 contains the diagram of the orbits of the satellites of Uranus, together with the times of their elongations.

Pages 667–668 contain tables for predicting the position-angles and distances from the center of the planet of the satellites of Uranus and Neptune.

Page 669 contains the diagram of the orbit of the satellite of Neptune, together with the times of its elongations.

Pages 670–671 contain the *Phenomena*, or the configurations of the Sun, Moon, and planets, expressed in the symbols of page xx. The predicted times of the conjunctions, quadratures, and oppositions of the planets with respect to the Sun are, respectively, the instants when the longitude of each planet differs from that of the Sun by 0°, ±90°, or 180°. For the conjunction of the planets with the Moon and with each other, the predicted times are the instants when the two bodies have the same right ascension. In the case of conjunction the degrees and minutes to the right indicate the difference of declination. Thus, ☌ ♂ ☾ . . . . ♂ $-4° 22'$ would be read "Conjunction of Mars with the Moon, Mars 4° 22′ to the South."

These pages contain also the beginning of the seasons; the perihelia and aphelia of the planets, including the Earth; the passage of the planets through the nodes of their orbits upon the ecliptic; the time of Mars' nearest approach to the Earth; the time of the greatest brilliancy of Venus; and the date of lunar and solar eclipses, with their aspect as seen from Washington.

Pages 672–681 contain the *Positions of Observatories*, together with a list of the authorities from which the positions are obtained. The tabular arrangement is self-explanatory.

Page 682 contains two examples in the computation of lunar distances, which are inserted because lunar distance tables are no longer published.

Pages 683–707 contain a series of tables numbered from I to VII.

Table I—*For Finding the Latitude by an Observed Altitude of Polaris.*

Table II—For converting *Sidereal into Mean Solar Time.*

Table III—For converting *Mean Solar into Sidereal Time.*

Table IV—For Finding the *Azimuth of Polaris at All Hour Angles.*

Table V—For Finding the *Azimuth of Polaris at Elongation.*

Table VI—*For Finding the Times of Upper and Lower Culmination of Polaris.*

Table VII—For finding the *Apparent Place, Time of Upper Culmination, and Time Interval between Upper Culmination and Elongation*, of Polaris.

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